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INDUSTRIAL PSYCHOLOGY AND GOVERNMENT[1]

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THE professional activities of psychologists have become highly diversified. Some practitioners are engaged in improving the processes of formal education and in adapting them to the varying needs of different learners. Some have specialized in personal consultation with adults, or with youth, regarding their occupational plans or their problems of adjustment to trying situations at home, at school, or at work. Some are constructing barometers of public opinion or of group morale or of consumer preferences or of susceptibility to propaganda. And some are connected with welfare agencies, reformatories and other institutions caring for persons whose true condition the psychometrist's examinations help to diagnose, and whose future usefulness and happiness depend in part on the psychologist's insight.

No less varied are the fields of specialization among those of us whose psychological practice takes us into commercial firms or industrial plants; for here we find all sorts and conditions of men with every kind of problem—of learning, of emotional control, of personal attitude, of group relationships—even as in a prison or a college. Let us consider, then, the purposes and nature of industrial psychology and examine certain instances in which its principles and methods have found application in governmental enterprises. Somewhere in this picture, each psychologist, whether affiliated with the educational, clinical, consulting, or industrial sections of the American Association for Applied Psychology, will recognize a place for his own

[1] Address delivered at the annual meeting of the American Association for Applied Psychology, Washington, D. C., November 24, 1939, by the Vice-President and Chairman of the Industrial and Personnel Section.

kind of professional expertness within the activities of government.

I.

The expansion of publicly administered enterprise is one of the amazing phenomena of these fast-changing times. Uncle Sam manages a far-flung land business, reclaims arid deserts, supervises forest reservations, national parks, and recreation grounds. He operates arsenals and navy yards, initiates housing projects, builds and maintains highways, and constructs dams like the Grand Coulée which dwarfs the pyramid of Cheops. His printing plant surpasses Donnelley's in volume of production. In banking and insurance, his staffs of executives, accountants, actuaries, and office employees are larger than those of privately managed concerns. The Post Office trains and supervises a hundred thousand mail clerks. Few power companies have heavier investments or more complicated problems of production and distribution than the Tennessee Valley Authority. Government has indeed taken on the nature and the functions of a complicated industry.

No wonder, then, that psychological problems encountered by private industry are met by executives and workers in government also. Any undertaking, whether sponsored by the state or not, faces problems in the organization of work and in the occupational adjustment of its workers. The employees are certain to differ one from another in abilities, aptitudes and temperament. They are subject to the damaging effects of discouragement, of monotony, of excessive fatigue when ill-adapted to their tasks or not adequately trained to perform them. The incentives, whether financial or non-financial, to which they respond are much the same whether or not the paycheck comes from a public treasury. Desire for personal recognition, for security and for a chance to be occupied at worthwhile work is common to all. Excessive noise, bad ventilation, unsuitable lighting tend to cut down output, as do the more serious hazards of arbitrary supervision, of emotional stress, of uncongenial associates. Development and maintenance of

cooperative relations between executives, supervisors and workers, avoidance of unnecessary conflict, smooth functioning of all parts of a complex organization, are essential whether the enterprise is carried forward under public or private auspices. In both areas the discovery and development of exceptional talent for carrying administrative responsibility is a matter of concern. Government, indeed, has quite as much need as private industry for the methods and findings of industrial psychology.

II.

The purpose of industrial psychology is, as we all know, twofold. It aims to increase the satisfactions of those who work, while helping them to accomplish more.

To this end, the work to be done is studied and then organized in ways which conserve resources of human energy, forestall irritations, minimize accidents, facilitate output, and effect economies of operation. Toward realizing this objective, investigations of psychologists in the service of government as well as of private industry have contributed.

The studies made for the Civil Aeronautics Authority by Ross McFarland and his associates of the Harvard Fatigue Laboratory provide a striking example; for these federally sponsored researches have had applications in both governmental and non-governmental enterprises.

Aviation is a lusty young industry. With its development have come new hazards requiring exceptionally careful scrutiny of human ability, and of the conditions, both outer and inner, which affect an operator's judgment, skills and self-command. An airplane is like an automobile, a locomotive, a steam shovel or any other mechanism which responds to the manipulation of levers and controls as the operator notes and acts upon changes observed in his surroundings. Aviators, like crane operators and truck drivers, are subject to distractions, to fatigue, to lapses of attention. But flying introduces added variables into the formula of competence. As high altitudes are reached, the supply of oxygen diminishes. Continued in-

sufficiency of oxygen has effects—sometimes unnoticed by the operator—on speed and precision of action, scope of attention, sense of responsibility and social attitude. The nature of these obscure phenomena was not well understood. McFarland, proficient in the exact study of the psychological and biochemical changes induced by variations in oxygen supply, was called upon to summarize existing knowledge and to extend it through fresh experimentation. His researches were carried forward in the High Andes and during flights over the Pacific and the Atlantic, as well as in the experimental chamber of the Fatigue Laboratory where atmospheric pressure, temperature, humidity and oxygen-content can be controlled in a way to reproduce conditions under which pilots must operate. Significant discoveries were brought to light.

It was observed, for instance, that pilots—a carefully selected group—when compared with control subjects or passengers, show definite evidences of acclimatization to high altitude conditions, as indicated by a greater number of red blood corpuscles and a higher alveolar oxygen pressure. And it was found—contrary to suppositions which generally favor youth over age—that the more stable neuro-circulatory responses of individuals 45 to 65 years old enable them to adjust to the effects of oxygen insufficiency as well as, or even better than, younger men. In any event, resort to the oxygen tank is now indicated at about 11,000 feet, a lower altitude than that at which common practice had located the threshold. These findings have aided the Civil Aeronautics Authority in establishing and revising codes and standards of operation. Military aviation, too, has profited.

But the benefits have not been limited to aviation alone. As by-products of these researches, new light has been shed on other causes of worker inadequacy. A marked similarity was observed between the changes in mood and behavior produced by oxygen insufficiency and those resulting from alcohol and from excessive fatigue. All three phenomena of diminished competence were found to be significantly related to measur-

able biochemical changes in the blood stream and the vital organs to which it carries oxygen. Following these leads, the Interstate Commerce Commission, undertaking to establish a factual basis for regulations governing maximum hours of employment of truck drivers, has made use of McFarland's techniques, yes, in certain instances, of his very instruments, in measuring the effects produced by long periods of continuous driving. And traffic courts are beginning to attack with fresh confidence the troublesome problem of how to ascertain whether a reckless operator is actually guilty of drunken driving. Safety on the highway as well as in the air is being promoted to the advantage of workers, employers and public, thanks to governmentally sponsored researches in industrial psychology.

III.

We might call the roll of other researches. Prominent in such a listing would be O'Rourke's early contributions to the organization of work in the postal service and the substantial improvements which he and others have made in the methods of selecting, training, rating and promoting public employees and building their morale. A catalogue of such industrial studies undertaken on behalf of governmental agencies would be too long to include here. Instead we may profitably recall the contributions of one of the pioneers of applied psychology, Raymond Dodge, who during the first world war, in common with many of his colleagues, placed his professional abilities at the disposal of government.

In those days poison gas was a novel weapon. As a defense against it, thousands of gas masks were being manufactured. But they were found to come short of expectations because combat troops, under the stress of danger, yanked them off and threw them away. Why? The question was put to Dodge who quickly located the trouble. He noted that although the mask fitted the head comfortably enough, it restricted too narrowly the field of peripheral vision. The wearer of a gas mask on the battle field, or of a respirator in a dusty mine, is uneasy

if he cannot see what is going on beside him without turning his head—a fact which engineers designing such safety appliances had somehow overlooked.

For the Navy, Dodge prepared a battery of examinations for selecting men to be trained for the firing-control squads and also ingeniously designed an apparatus used in selecting men who could be quickly trained as accurate gun-pointers. In so doing, he exemplified three principles of industrial psychology: first, that the psychologist must know the precise nature of the worker's task and identify its difficulties; second, that tests for employment should be closely analogous to the difficult parts of the work to be done; and third, that an instrument useful in selection may be constructed in a way to have value also in the training of employees so selected. Moreover, his contributions to a practical understanding of the psychology of propaganda explored an area which only now, after twenty years, is receiving from the psychological profession the close study it requires. His ingenuity and scientific insight were focussed on these practical problems because of the needs of an arm of government.

The work of psychological examiners under Major Yerkes' command in the office of the Surgeon-General of the Army, is familiar to all.[1] Likewise the accomplishments of Thorndike, Scott, Watson, Angell, Strong, and the others who served in the Committee on Classification of Personnel. Here and in the Personnel Branch of the General Staff we wrestled with problems of occupational classification, interviewing, trade testing, and the budgeting of the requirements of a great organization against the assets of available personnel. How was it that psychologists could bring to the personnel management of a national army the requisite practical background? In part, at least, it was because the difficulties faced and the methods of their solution did not greatly differ in essentials from problems already met in private industry. After the war, a transfer took place into industry of some of the personnel methods and skills developed during the emergency, completing the cycle of ex-

change between industry and government, each of them benefiting from the contributions of the psychologist's work in the other field.

IV.

Will our profession soon be called on to fight again? If so, on which front? In what capacity? These questions lurk in the thoughts of everyone.

But let it be remembered that for several years we have been witnessing here in our own land a conflict scarcely less terrible than war: the fight for jobs, the struggle for such personal security as only steady employment in a worthwhile occupation can provide. In this emergency, not only industry, not only government, but the whole life of the nation has a stake.

Here are the bald facts. The volume of production of goods has finally reached the 1929 level again; but the population has meanwhile been steadily increasing so that there are six million more workers clamoring for employment now, with the result that the typical American youth, on leaving school, spends three years in futile job-hunting and in learning the habits and skills of idleness before he finds his first job.

Are not the wounds inflicted by such frustrations often as crippling as those from shrapnel or poison gas?

The campaign for millions of new jobs in productive employment must be fought and won. Here is an inescapable challenge to every psychologist, first to realize clearly the nature of the emergency, and then to volunteer for the specific type of professional service which he is best able to render in helping to increase the available opportunities for work.

There is plenty of work to be done. No one today can question the need for additional goods and services which industrial expansion could make available. Think of the enormous shortage of low-cost housing, such as the countries of northern Europe have shown it feasible to construct. Similarly, if food, clothing, transportation—not to mention health, recreation and education—are produced in better quality and greater volume

at substantially lower cost, the standard of living will be raised while this increase of production will furnish occupations to millions now idle.

In order that these things may come to pass, the log-jam to industrial expansion must be broken. America's unemployed savings must be invested in additions to plants and equipment. New industries must be started; new kinds of goods invented and marketed. Processes of manufacture must be improved, as they have been in the automobile industry for example. To insure these developments, the most serious hindrances to the healthy growth of our economy must be identified and removed, whether they lie in the tax structure, the financial policies of government, the administration of relief, the practices of bankers in hesitating to help finance small enterprises, or the shortsightedness of leaders of organized labor and of employers with whom they deal. The problem is complicated but not insoluble.

Possibly the most serious obstacle of all is confusion in the public mind. This is traceable to unawareness of essential facts regarding the effect of various governmental policies and practices on the willingness of those who have uninvested savings to risk them in industrial expansion. Workers and employers, consumers and investors alike, are uninformed or indifferent. In dealing with this ignorance and confusion, economists, legislators, statesmen of the business and labor world have a double function: first, that of clearly formulating the problems, and second, of educating the leaders and voters of all parties as to the essential facts.

To the strategy and tactics of this campaign of public enlightenment, the educational psychologists of our professional group can definitely contribute if they will. Specialists in the measurement and appraisal of public attitudes also have a specific function here.

On another sector, should not a larger number of clinical and consulting psychologists volunteer for immediate service in local occupational adjustment bureaus, so that there may be fewer vocational misfits, wiser planning of careers, more well-

adjusted workers, and consequently more and better goods and services available to a larger proportion of the population?

Toward realizing this goal, industrial psychologists are doing their part insofar as they succeed in their main purpose of enabling employees, whether of private or public enterprises, to do more and better work with less expenditure of energy, under conditions yielding greater satisfaction to them.

These are a few ways in which psychologists may effectively bring to bear their several kinds of professional ability in the face of a great national need.

In summary: the area within which the psychologist functions is a broad one. But whether his specialty lies in the educational, clinical, consulting, or industrial field, he encounters among governmental services many of the same psychotechnical problems as in private industry, or in schools, or in agencies of social welfare; indeed, wherever work is being done and people are in need of adjustment to their situations. No matter where he is engaged, he cannot fail to realize that the most insistent demand of our time is for rapid expansion in the number of opportunities for employment. His ingenuity and technical abilities can greatly help industry and government cooperatively to meet this demand. Military mobilization of the psychological profession may or may not take place this year. But the shortage of work opportunity calls for our enlistment now in this campaign for additional productive and satisfying jobs.

THE CHALLENGE TO CONSULTING PSYCHOLOGY[1]

The Psychological Consultant and The Psychological Charlatan

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WITH the other constituent sections and our central body we are now reviewing two years of activity. Our origins were of marked significance in determining the structure of our present organization. In fact many felt that organization was the happy solution to our many complex and somewhat complicated problems. The glaring necessity of continuing change will in all probability shortly disillusion the most sanguine. However, the purposes back of organization will not only prevail, but become more vital in function as improved organization and operation enables us to integrate our coordinated efforts.

Specific purposes of organization may be worded in terms of lofty ideals of mutual enlightenment and the enrichment of scientific endeavor. However, psychologists, of all men, must realize that group activity involves the basic concept of gregarious self-protection; that self-protection however being used also as a tool to guarantee the best possible service to members of other groups or the total social order—shall we say the pubile individually and collectively.

Many of our members have given extended time and thought to plans for activities, which they hope will solve this gnarled problem. Some have felt that organization is enough, forgetting that power and prestige of organization may be merely a

[1] Address of Vice-President and Chairman of the Consulting Section of the American Association for Applied Psychology given at the Third Annual Meeting, Washington, D. C., November 24, 1939.

latent and ineffectual force unless released by the activity of the individual members. Some have felt that Standards and Codes of Ethics will suffice, forgetting that Ideals are concepts to which have become attached dynamic feelings of individual experience, and that therefore group ethical practice can rise no higher than the ethical practice of the individual members of which it is composed. Some have felt that Legislation controlling the members of the group in a positive way will control non-members in a negative way. Other solutions are offered, all in final analysis centering upon the basic problem of distinguishing between the constructive capable service of reputable consultants in psychological service and the destructive activity of the charlatan or disreputable practitioner.

As we give our attention to this basic challenge to Consulting Psychology, we must recall several specific items of psychological advice frequently given to individuals, and squarely face the problem of following our own advice in this matter. As we so often advise others—this is a problem in which the full power of rational thought must be employed, freed in so far as individually or humanly possible, of all attitudes, prejudices and rancor, permitting the effect only of those feelings and emotions which will guide us in paths of fairness and justice to all concerned.

The disreputable practitioner, the charlatan, or as he is frequently called, the quack, is not a new-comer to the stage of human activity. In brief his origins may be observed in the dim past of man's first effort to establish himself as a special worker among his fellow men. For immediately there arose those who, while unwilling to expend the time and energy necessary for proper training in doing the service at hand, none the less clearly recognized that by sheer force of clever imitation they could readily gain the benefits—and always greater economic benefits—accruing to those skilled and experienced in the service.

The charlatan has thrived throughout all ages, his activity taking rise again and again in each new development of man's

advancing culture, to the point that his history is but the record of the under-world of man's culture, science, and reputable service to his fellow men. The reputable worker and at least a fair portion of the social order of each succeeding generation has known the risks and spent some effort to protect himself and the public, but frequently with only slight success so far as we can observe.

The specific challenge of quackery to Consulting Psychological Service is probably greater than to any other specific service today save the diversified field of religious cult practice in which may be found the origins of the quack and to which he even now seems prepared to take final flight. The dissemination of knowledge fundamental to most other professions rendering service to human kind is sufficient to have driven the charlatan to seek other activities especially for cover and defense. Psychological practice is today his greatest opportunity. No field has ever offered the quack richer opportunities. The potency of the human mind has ever been a fertile field for his endeavors; now enriched by the amassed experience and culture of the past the charlatan readily employs this so-called "omnipotence" of the human mind as the basis of his predatory activity.

The very nature of psychology lends cover to his activity. The psychologist's materials of trade and service are primarily ideational in nature and lend themselves readily to the distortions of the quack's inspirational interpretation. Experience with other sciences has taught him to shy away from purely objective procedures and techniques for fear of easy detection. And to a slight degree, he is somewhat deterred by some of the more objective techniques of psychology though some forms of objective apparatus now and then suggest to him the most blatant form of mal-practice, since he not only cashes in on his usual "gab," but sells the special apparatus at a price also. But the intangible and illusory content of the vast subjective section of psychology becomes his workshop and his protection at the same moment.

While psychologists with some trepidation cautiously unwind the snarled threads of divergent theories, the quack confidently grasps that thread which, drawn with sufficient enthusiasm, unlooses the draw-string on the purse of the gullible. The quack's theory always works: "Self-realization" realizes a tidy sum for him; "catharsis" disgorges gold and silver for him.

We have no need of further description of quackery, much less the presentation of illustrations or examples of the charlatan's cleverness, his advertising, or his economic aggrandisement. Such descriptive samples would be highly amusing to you; but entertainment is not my purpose. May I ask you to look into the psychologists' contribution to this field of human depredation.

Enough has been said of the substance or material content of the field of psychology as the great source of supply both of ideas and practice. Psychologists can scarcely be blamed for this so long as they direct sufficient effort toward the solution of the great epistemological problems, the dissemination of knowledge concerning the scientific content of the field, and the improvement of their techniques. But there are certain activities of the psychologist which aid and abet the illegitimate use of his scientific findings and affect his own professional opportunities and the employment opportunities of young workers which he can scarcely overlook.

It has long been the custom of some of the most thorough of our research workers to add to the presentation of their factual data and the proper interpretation of the same, certain rather questionable discussions of so-called practical implications and even more dubious suggestions of applications to human behavior. Practically all such suggestions far outdistance the scientific and factual data. We may even recognize that they are usually presented for the purpose of arousing thought, stimulating further research or even of anticipating future developments of the concepts investigated. However, the slightest knowledge of quackery will reveal that this is the shadowy sector of science in which the quack finds his best

working tools. Nor need we condemn the quack too severely. When a College Official of high standing in the educational world accepts the challenge of practical suggestions which had been added to scientific articles presenting investigations in the learning processes, presents to one of the most representative associations of Colleges and Secondary Schools of our country the possibility of our giving the student his educational training and knowledge rather painlessly by means of some reproducing apparatus during his periods of sleep, can the most sanguine expect that the quack will not exploit the "Psychophone." So long then as those responsible for the preparation of such scientific data in article form, approve such presentations, and so long as editors of our journals accept and publish them, we shall continue this source of supply. I am not ignorant of the charlatan's genius in adapting our material even should this source be denied him; but I do persist in asking why psychologists continue to do so much of his under-world thinking and planning for him?

At the same time we can scarcely overlook the necessity of greater caution on the part of the reputable consultant, and even more specifically those many experimentalists, research and theoretical workers in establishing these distinctions which are only now becoming clear to the professional group as a whole and are not yet recognized by the general public. The dangers which beset the most skilled workers in applied techniques are not lessened by any excuse that some one else will make the attempt with more illegitimate procedures if he does not yield to the temptation of "trying" something for which he is totally lacking in preparation and training.

A frank admission of inability or dearth of techniques and experience on the part of the legitimate worker may not stop the practice of the illegitimate worker, but it does set the contrast which will ultimately reveal clear cut distinctions. The experimentalist who was recently asked to put an individual in "some state of subconsciousness" to help him recall where he had hidden some misplaced jewelry, not only recognizes this as

an inadequate set-up for experimentation, but also as an opportunity to draw sharp contrast between the application of available scientific knowledge and the chicanery of the charlatan. The consultant who is frequently asked to dictate by direct guidance the exact actions of an individual, knowing full well the limitations of his present techniques, has an unusual opportunity not only to help the individual in understanding his personal problem of individual self-determination, but also to set out clearly the contrast between his activity and that of the "omnipotent"—not to forget "omnipresent"—quack.

Should this contrast become ever so clear with the passing of time, there remains one area of shadowy confusion which we of necessity will continue to face with all of its perplexing problems. The employment opportunity of our young workers—of the adequately trained, of the partially trained, of the poorly trained, and of the incompetent—produces a confused situation which the public will not be able to comprehend for years. Now, first I wish to make it quite clear that I am thoroughly sympathetic with the young workers in their individual and collective problem. It is in all probability largely of our own making.

The young worker, lacking opportunity for continued training, faced with financial need, and led astray by the apparent ease with which his elders have established themselves, can scarcely be blamed for taking advantage of every opportunity to use the prestige of his training and association contacts. Sure of himself—and he may rightly be so on occasion—he none the less fails to recognize that the very distinctions which he hopes to make between his training and the inadequate preparation and experience of the charlatan may be so clouded by his attempt to establish himself that the distinction becomes less and less clear to the public mind. The snarled problems of classes of membership within our associations, the certification of levels of workers, and licensing by legislative authority are made more and more difficult of solution, when the young worker attempts to over-capitalize his status in the way of

association memberships. In so doing he fails to capitalize the greater benefit accruing to him and the profession through advancing by proper training and experience to the higher levels of membership, certification and licensure.

Sufficient unto the day is the evil of our own making in the American Association for Applied Psychology, but those who so desire can circumvent and thwart our purpose all too easily. For example, witness the advertising of a young worker claiming to be a member of the American Psychological Association, in spite of the fact that his election to Associateship took place only last September and his name is not yet found in the Year Book. And even though he protects himself somewhat by correctly presenting himself in a later paragraph as an Associate he attempts to bring to bear upon the mind of the public and especially the educational world to which he addressed himself, the full weight and authority of the psychological field through his membership as follows: "The integrity of this organization is vouched for by the fact that the test consultant engaged in this work is an associate member of the American Psychological Association, . . ."

The young worker must decide for himself whether he desires to continue this shady area in which he must most assuredly compete, not so much with the legitimate worker (probably no more clever than he) as with the illegitimate—shrewd and clever beyond his understanding. For it seems quite clear that his very behavior lends continued credence to the similarity of endeavor and his very activity adds prestige to the charlatan's remarkable list of credentials.

However, some would have us believe that legal process would readily solve the problem. This some feel would be momentarily true, if the present trends toward proper classification of membership, certification, and legislative licensure were completed. My recent experience with legal procedure in such a case under our present professional status, I am convinced, leaves much to be desired. But there is ample legal procedure now available which applies not only to our field but to many

long established with apparently adequate statutory or legal status to illustrate the complexity of our problem.

Last Spring it fell to my lot to be summoned as a witness of fact and also to be qualified as an expert in what I deem to be the first case involving the direct problem of psychological service. During the January 1939 term the Grand Jury presented to the District Court of the United States for The District of Columbia an indictment against an individual, charging that that individual "stated and represented herself to be an international authority and lecturer on nutrition and psychology and a mental healer," and that the individual "unlawfully, knowingly, designedly and with intent to defraud, feloniously did pretend and represent. . . ."

The facts developing out of this indictment led to the conviction and sentencing of this most charming individual—one readily recognized to be among the cleverest of the entire group. She has appealed the case and therefore I think it best for me to delay any detailed discussion of the same. Nor need I present to you any of her advertising which on the whole is duplicated by hundreds of others. It might seem amusing to you, were it not pathetic. To read from her "Master University Course in Personality Building and Character Development for the Individual" would be even more amusing, yet even more pathetic.

Some of my observations in the midst of this and other experiences may shed light on our present problem however. Having been in difficulty with the law on previous occasions due to the statutory entrenchments around the practice of medicine the quack is apt to adhere more closely to the less guarded field of dietetic influence on personality and defend themselves by means of the psychological import of their work. This becoming impractical in the presence of fact, their attorney may decide to admit the expertness of testimony and attempt to twist the defense into the field of religious cult or faith healing.

The most one can do is to point out clearly that no Psychological Association in America has any requirements, limita-

tions or inclinations regarding this field of work either for members or the group. But the implications are clear. Having claimed psychological standing and finding that challenged by fact, and fearing any return to the medical field with its more legally guarded activity, the escape is into the most lightly restricted and almost entirely legally unguarded field of religious cult practice.

One must further observe a marked difficulty in the minds of any court or jury in deciding the relative weight to be attached to our own national or even international organizations in the psychological field in comparison to the inevitable listing of innumerable other organizations with names and avowed purposes even more patently significant to the casual observer. Credence can only be given to those publicly known and readily recognized and understood implications of legitimate organizations after time has substantiated their status.

Nor can legal prosecution run far ahead of social and public acceptance of constituted authority, prestige and professional status. Success in specific prosecutions must be credited largely to the keen analysis and understanding of the Prosecuting Attorney. His clear comprehension of the problems of professional status and his ability to bring about such understanding in the minds of the jury are typical of the responsibility for public enlightenment which we must accept and meet with concise presentation of fact and action.

While reading the estimates of the number of quacks in the psychological field and something of their activity in A. A. Roback's recent book *The Psychology of Common Sense,* I was prompted to look up some of the figures on reputable workers as compared to quacks in other professional fields. In the fields of Medicine, Dentistry, Law and Education, all well protected by statutory entrenchments, the figures were too large and confusing for presentation at this time. Roback estimates that there are approximately 15,000 quacks working under psychological cover at the present time. He further estimates from the amount of advertising in numerous magazines—some of which

are solely for this purpose—that these workers spend approximately $1,000,000.00 a month on advertising. Twelve million dollars per year for advertising leaves one to guess at the approximate money take of these charlatans. Your guess is as good as mine. One can be sure that the economic waste to the public runs into many millions beyond the recovery of the expenditure for advertising. Compared to the possible—but probably excessive—estimate of 5000 reputable workers, and allowing an average yearly income of $3000 per worker, the advertising of the quack practically equals the support of the entire field of reputable workers.

To be sure this large number includes those who still dabble in the fringes of other professional services, in spite of the legal protection given by legislation and the extensive knowledge of the public, as well as those that must shortly take refuge in the least protected though the most vital area of human life—the religious.

As one pursues this analysis and observes the effort made by legislative power to extend the protection of the state to the public, and sees branching out from the medical field a great number of lesser protective measures involving the licensure of Inspection and Purveyance of foods, the baker, the barber and others, one cannot fail to consider the public interest in its own welfare. Yet largely because of what Roback has called the public "Will to be fooled," we can scarcely believe that the public will continue to give its present support to the activity of the psychological profession unless in addition to service rendered it disseminates that knowledge and understanding which will enable the public to protect itself from the depredations of the irresponsible charlatan.

In concluding one may rightfully suggest that my pessimism has outdistanced my enthusiasm. Perhaps I have seen a challenge and mistaken it for a threat. Perhaps time and watchful waiting will solve the problem. Perhaps time is enough—if we ourselves keep moving in the right direction and at the same time keep the public well informed. This is the challenge to Consulting Psychology.

SOME THINGS WE KNOW IN CLINICAL PSYCHOLOGY*

EDGAR A. DOLL

The Training School at Vineland, New Jersey

ONE of the dangers of any science is that of becoming so absorbed in frontier problems that the substantial background of that science becomes neglected. Those in the vanguard of current progress run the risk of losing contact with fundamental issues. This leads to the paradox of gaining speed at the expense of momentum by unsuspected loss of mass.

Thus in clinical psychology, preoccupation with the use of mental tests has certainly led us away from the larger questions of mental diagnosis which these tests are designed to clarify. The child dominates the family, the servant becomes master, the camel monopolizes the tent. Mental tests are indispensable tools but they are not the whole of our kit, nor is their skillful use the sum of our profession.

The normal human eye affords both distant and near vision. We do not forego the one to employ the other except momentarily. One yields perspective, the other detail. The macroscopic view needs supplementation by microscopic analysis. The latter dispels the former but is meaningless without it, for high power magnification is designed to elaborate rather than to displace the low-power field. Interest in the cross-section must not be permitted to displace regard for the organism of which it is only one aspect. So the foreground of psychometry on the canvas of mental diagnosis reflects but immature art unless balanced with background of history and problem which are necessary to good composition in any clinical picture.

* Address of the Vice President of the Clinical Section of the A.A.A.P., read at Washington, November 24, 1939.

In the business of advancing the frontiers of clinical psychology so much attention is now being paid to debatable issues that we are losing sight of established knowledge. And the academic disparagement of controversial postulates withers the substance of emergent practise. This address aims to reaffirm some things we know in this field rather than to discuss the uncertainties which beset us in advancing our profession. It is obviously impracticable in twenty minutes to inventory the whole of our staple stock, but perhaps we can regain some lost assurance by balancing the realities of long conviction against the mirage of recent inquiry. To this end it may be profitable to illustrate from a few examples.

1. We know what clinical psychology is, namely, the professional study of individuals by psychological means for purposes of their adjustment or effective self-expression. We appreciate that clinical here means "in a given case" and implies evaluation by comprehensive procedures. We appreciate that psychological techniques include anamnesis as well as measurement. And we appreciate that adjustment includes harmony, balance, and effectiveness in the relation of the individual to himself as well as to his surroundings. We may even add a few words on what clinical psychology is not, namely, not mere segregation of the individual in respect to some single attribute, not mere determination of psychometric status, nor mere classification without implications for treatment, not mere description without implications for future status. Clinical psychology is concerned with diagnosis, prognosis, and treatment with the implication that these are differential, unique, or individual.

2. We know that a clinical psychologist is one who practises clinical psychology, and that a teacher of clinical psychology merits the designation of clinical psychologist if he is also versed in practise. We know that the degree of adequacy of such practise and teaching requires more careful specification than heretofore. We know that formal instruction, prac-

tical experience and personal aptitude are the ingredients of success even though we are not agreed on the essential proportions of each. There is much reason to believe that present standards of instruction are not adequate in quantity, quality, and scope, and that this instruction must be supplemented by experience since the laboratory supplementation of classroom teaching is at present too meager in all but a few centers of instruction. There is also reason to believe that standards of field experience should be strengthened or formalized so that such experience may be acceptable in lieu of or in supplementation of classroom and laboratory instruction. We know that mere degrees, or years of student application, do not guarantee successful practise or even do not provide a necessarily useful index for the likelihood of mastering good practise. But we also know that sound preparation is highly to be desired, that advanced degrees or years of graduate study increase the likelihood of good practise, that such preparation tends to select for better personnel. In short, we are agreed on the principle of better preparation even though we may not be agreed on the details, for we know that teaching and practise are mutually dependent and that each merits the other's aggressive support.

3. We know that the over-all technique of clinical psychology is contained in the clinical syllabus which is the generalized outline of clinical psychological analysis. We know that this syllabus requires two major aspects of examination, namely, history and present status. We know, or should know, the details required in a given case which constitute a competent review of an individual history and a competent examination for present status. We know further that these should bear a direct relation to the type of problem presented in the individual case with due regard for such variables as age, sex, and other relevant details.

4. We know that mental diagnosis is the major objective of clinical psychologists. We know that this is an art which

employs (and also creates) scientific techniques. In reducing a case-study to its diagnostic essentials we know that a comprehensive evaluation of *all* data, history and status, requires more than the preliminaries of trait classification. Thus, we know that an IQ suggests intellectual gradation without yielding diagnostic differentiation. We know that classification in respect to any single aspect of individuality does not yield the returns that flow from diagnosis. For the import of the latter derives from its implications not only for classification but also for etiology, prognosis, treatment and disposition. The diagnostic syndrome we know as a shorthand epitome of symptom-complexes. It is a categorical expression for a comprehensive sequence of events and possibilities. It conveys status in terms of cause and effect within the limits of diagnostic knowledge. And to achieve a diagnosis requires analytic-synthetic interpretation rather than mere factual description.

5. We know that every clinical psychological "case" originates in some social problem, that is, some social situation with reference to which the individual's adjustment to himself or his surroundings is specifically pertinent if not unique. We know that this problem is susceptible to systematic analysis through the formulation and verification of hypotheses designed to provide an empirical solution of the difficulties. We know further that this problem is presented with reference to some social solution and that this solution by implication requires treatment designed to bridge the gap between present and future status or between diagnosis and prognosis. And we know that competent analysis requires familiarity with the most probable outcomes in relation to given types of treatment in given types of cases.

6. We know that the careful evaluation of the social problem presented in a given case requires clear specification of its present seriousness and antecedent history. We know that this evaluation may require the joint services of other professions, especially those of medicine, regarding the correlation

of disabilities or assets which may be present. We know that the evaluation should broadly include mental, physical, and social evaluation, the latter perhaps including educational and occupational details. And we know further that the mental evaluation should include at least intellectual, emotional, and volitional evaluation, not overlooking the borderland of psychophysical performance included under such rubrics as sensory and motor activities.

7. We know that the integrity of the organism, structurally and functionally, underlies the evaluation of behavior or mental activity, and that this should be guaranteed or its abnormalities made clear through competent medical collaboration. We know further that numerous details of individual behavior may require collaboration with colleagues in psychology or in related fields regarding those specialized aspects of behavior in respect to which the clinician may not himself be clinically competent. We know that these details include such items as degree of maturation, or level of performance, in respect to such broad categories as intelligence, personality, skill, interests, attitudes, habits, conditionings, and the like which compose the subject's unique individuality from the point of view of psychological evaluation. We know further that these details must be related to the social problem presented by the given case and to his age, sex, and relevant details.

8. In the evaluation of both history and status, we appreciate that the clinical psychologist may not himself be sufficiently versed in all the problems and types of cases presented to be personally adequate under all circumstances. We appreciate that the clinical psychologist must be at least well enough versed in his art to be able to assort his cases for competent reference to professional associates who can supplement his own experience, knowledge and skill. We know that the competent clinician should therefore be cautious in trusting too much to his own knowledge when the type of case is outside

his own field of experience. We know therefore that the competent clinician must be well-advised as to sources other than himself to whom cases can be referred for competent collaborative consultation. We know that this knowledge of the clinician's own limitations is essential to good work, and this acquaintance with resources outside himself is a necessary part of his equipment.

9. We know that the clinician must be widely acquainted with standardized psychological tests for determining present status and for interpreting the results of such tests for diagnosis, prognosis, and the implications for treatment. We know that he must have definite assurance, or perhaps intelligent misgivings, regarding the success with which the tests fulfill the purpose for which they are employed. In this psychometric aspect of clinical psychology, which is itself only a *sine qua non* rather than the whole of the field, one might prepare several articles such as this on these details alone regarding, for example, what we know about the nature of the performances at issue, the reliability of the measures employed, the pitfalls of interpreting such measures, the logic of their experimental background, their statistical illusions, the representativeness of the standardization samples, the validity of deviation scores, the pooling of diverse results, and many similar issues. It should not be difficult in such a supplement to the present paper to maintain the major thesis that we do know a great deal, even though this may be but a small fraction of what is yet to be learned.

One might go on to much greater length. What has here been offered is only representative of the kind and amount of knowledge that makes clinical psychology possible as a legitimate field of professional application. Surely to concentrate on what we know will not be interpreted as meaning that we know all there is to know, or enough to declare a holiday on research. Yet while the bridges of knowledge are being built across the chasms of ignorance, traffic must be main-

tained, and while roads and highways are being improved and extended, traffic must be continued along the primary lanes of travel. And let us not spurn too uncharitably those detours which keep traffic flowing.

But while we know these things today, we also know that they will not always remain so assured as they now seem. Knowledge is fluid, not static. Science leaves no room for complacency. Everyone engaged in research appreciates that the principal outcome of a given investigation is to disclose more new problems than the old ones it set out to solve.

DOES THE QUESTION FORM INFLUENCE PUBLIC OPINION POLL RESULTS?

ALBERT B. BLANKENSHIP*
Hartwell, Jobson & Kibbee

WITHIN a few short years the public opinion poll has become an integral part of our national life. According to reports, the poll results are now operating as an influence upon legislative action. The accuracy of the election-prediction type of poll has been well demonstrated, but the accuracy of the political and social *issue* poll has still not been proven, despite the fact that all polling agencies admit that their work on issues is of considerably more import to democracy.

There is practically no question about the sampling of people which the polls include—election prediction shows that this factor is well controlled. But recently a number of persons have attacked polls because of their wording of questions.[1] Since this is a fundamentally important issue to the accuracy of the opinion poll, an experimental investigation was under-

* This experiment was designed and performed while the writer was a member of the staff of the Psychological Corporation of New York, and the study was made possible by a grant from this organization. The present paper is an abstract of a portion of a dissertation submitted to Columbia University for the Ph.D. degree, and is to be published in full in the Psychological Record. Readers interested in details of the literature, the procedure, and analysis of results can refer to this article, which is to be in print late in March.

[1] The reader wishing to refer to these attacks can consult the two following articles: J. H. Spingarn, These public opinion polls, Harpers, 1938, 178, December, 97–104; and P. Studenski, How polls can mislead, Harpers, 1939, 180, December, 80–83.

taken to discover whether small changes in wording do influence the results secured.[2]

This investigation clearly revealed that small wording differences did cause considerable shift of answers, and the implications of this finding will be discussed at a later point in the paper.

Briefly, the procedure followed in the experiment was this. Three thousand residents of Irvington, N. J., were asked whether they were in favor of, or opposed to, the proposed state amendment concerning the legalization of horseracing and parimutuel betting, on which an election was to be held a day after the last interview on the study was completed.[3] The question was worded in five different ways:

> "Is it desirable to permit or to prohibit horseracing and parimutuel betting in New Jersey?" (Objective form)
>
> "Would you vote for or against the amendment to permit horseracing and parimutuel betting in New Jersey?" (Subjective form)
>
> "Is it desirable to permit horseracing and parimutuel betting in New Jersey?" (Positive objective form)
>
> "Is it desirable to permit horseracing and parimutuel betting in New Jersey: Yes, No or Don't Know?" (Positive objective with check-list)
>
> "Is it desirable to prohibit horseracing and parimutuel betting in New Jersey?" (Negative objective form)

[2] For full details of how wording variables such as the position of the answers offered, the completeness of the list of possibilities offered, positive and negative wordings, certain words in the question, etc., can affect the responses, see the original dissertation.

[3] The detailed procedure, described in the complete dissertation, tells how factors such as the time element, the context of the interview, and the interviewer element were held constant for each form of the question used. Moreover, the dissertation clearly establishes the comparability of the five groups of persons sampled (one group for each form of the question) in terms of sex, age, voters from each district, religion, race, country of birth, income level, ownership of automobiles, ownership of automatic refrigerators, ownership of telephones, and type of home (1 family, 2 family and apartment).

Thus a total of 600 persons was asked a question in any one form.

As a measure of predictive accuracy, the results from each of the question forms was compared with the actual vote cast. In making this comparison, only the answers of 1726 registered voters who said that they intended to vote in this special election were included.

Table 1 shows the predictive accuracy of each of the question forms:[4]

TABLE 1

Showing Predictive Accuracy of Five Question Forms

Objective	99.0%
Subjective	85.0%
Positive objective	87.4%
P.O.C.L.[5]	89.8%
Negative objective	92.8%

Statistically, five of the ten differences were found to be reliable ones.[6] The objective form is superior to all other forms in predictive accuracy, the negative objective is superior only to the subjective, while the position of the two remaining forms, although probably indicative, is not statistically reliable. This is only evidence that the objective form was best in this particular situation, however, and does not necessarily mean that the objective form will always be the best form of question in all surveys.

This study clearly indicates that minor changes in wording

[4] The figures in Table 1 were secured by subtracting the total accuracy deviation for each question form from 100%. For example, in Irvington, where the election results came out exactly 50% for and 50% opposed to the amendment, the objective question form showed 49.5% for, 50.5% against the amendment (don't know answers were disregarded here), a total loss of accuracy of 1%, producing 99.0% validity.

[5] "P.O.C.L." in this paper refers to the positive objective form with the check-list.

[6] In terms of the critical ratio.

may seriously affect the results secured on public opinion polls. These differences may not hold for other populations or other issues, but the result surely implies that where wording is an important feature—that is, where a percentage figure accurate within one or two-tenths is a necessity,—wording research with that issue will have to be performed before the final study can be made. Or, if opinion is found to be fairly evenly divided on an issue, for an accurate measure of that opinion, in addition to a large sample of persons to reduce the chance error, considerable wording experimentation will be required before it can be claimed that the results accurately reflect the status of public opinion on the subject.

TESTING COTTON MILL SUPERVISORS[1]

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THIS investigation is a part of a testing program which the Georgia State Engineering Experiment Station sponsored during the summer of 1937.[2]

Occupational groups studied other than supervisors were machine fixers, weavers, and sewing machine operators. The purpose in each group was to find the correspondence between test scores and job success.

The duties of a cotton mill supervisor depend upon the plant and the job. Supervisors for whom ratings were obtained worked in five plants of two Georgia textile organizations. Each department of a cotton mill has an overseer who ordinarily hires for his department, and does a certain amount of departmental planning. Thus there are overseers of carding, spinning, and weaving. Large plants subdivide supervision under "second hands" or assistant overseers, shift foremen, and foremen concerned with one activity such as cleaning. Supervisors of all these grades—overseers, second hands, and foremen—are considered in this study.

The duties of each are similar in that they have to maintain morale, do a certain amount of planning, and attempt to keep production up and costs down. The difficulty, responsibility, and technical skill vary but contain a common core. Minimum specifications of intelligence and personality might apply regardless of the department. Superintendents state that one of

[1] Paper read at the Southern Association for Philosophy and Psychology at Knoxville, April 15, 1938.

[2] The University of Illinois Graduate School Research Committee helped to make the study possible with a grant.

their most difficult problems is in keeping relations between men smooth, so some measure of the ability to "get along with the help" would be useful.

The Bernreuter Personality Inventory, Otis Self-Administering Examination, Higher Form,[3] Moss, Hunt, and Omwake's Test of Social Intelligence, and the Strong Vocational Interest Blank were given to 42 supervisors for whom superiors' ratings were obtained.

An attempt was made to have each supervisor rated by three qualified superiors, but it was not possible in all cases to obtain three ratings. All the ratings turned in were used in each instance whether there were one, two, three, or four.

One superintendent refused to furnish ratings of men who had been tested because of his expressed fear that the ratings might become public, even though he was assured of the contrary. That one of his poorer supervisors was related to an owner might have caused his refusal.

Ratings were made on the following rating scale:

One of best men ever on this job.	Better than most men who have had this job.	About like most others who have had this job.
Is not quite as good as the standard for this job.	Does such poor work should not be on this job.	

A value of five was assigned if the highest rating was checked, four for the next highest, and so on down to one for the lowest rating.

The reliability of the ratings is not definitely known but they are undoubtedly low. The reliability of the ratings for 24 men where only two ratings for each by the same two raters are considered is .37. The composite ratings are obviously more reliable than .37.

[3] The twenty-minute time limit was used in giving the Otis test.

TABLE 1

Tetrachoric Correlations between Composite Ratings and Five Variables for 42 Supervisors

	Moss	Age	School Grade Reached	Otis	Bernreuter Self-Confidence	Bernreuter Sociability
Rating	.18	−.03	.03	.37	.15	.09

TABLE 2

Similarity between the Interests of 115 Cotton Mill Supervisors and the Interests of Persons in Each of 24 Occupational Groups as Shown by the Strong Vocational Interest Blank

	A	B	C
Boy Scout Master	64	50	1
Policeman	57	53	5
Office Clerk	54	55	6
Accountant	51	55	9
Carpenter	38	54	23
Purchasing Agent	28	81	6
Vac. Cleaner Salesman	27	65	23
Personnel Manager	19	77	19
Engineer	12	61	42
Life Ins. Salesman	5	68	42
Dentist	4	53	58
YMCA Gen. Sec.	4	50	61
Musician	4	38	73
Real Estate Salesman	3	46	66
Doctor	3	19	93
School Teacher	2	52	61
Farmer	2	45	68
Chemist	2	25	88
Journalist	2	25	88
Minister	1	32	82
Lawyer	0	36	79
City School Sup't	0	25	90
Advertiser	0	4	111
Architect	0	2	113

Ratings would probably be more reliable if the raters were trained and if the rating scale was more specific. It was not possible to train raters beyond a hasty introduction in the present instance. Training should consist of supervised practice in rating where each rater studies his results for leniency, and for getting an adequate spread of ratings. Use of several rating scales containing more specific items should cause more accurate ratings since it would stimulate the raters to observe

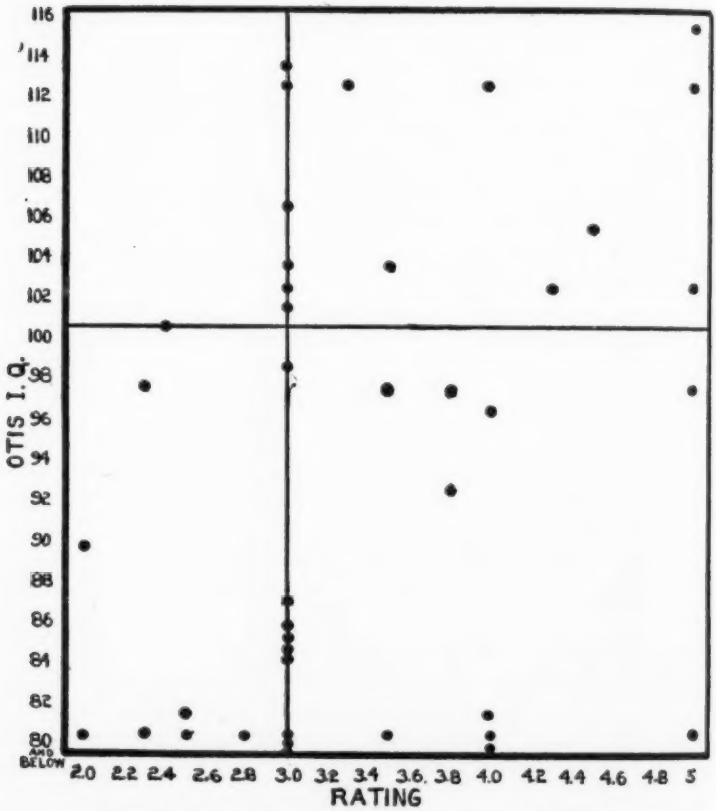

FIG. 1. Comparison between Rating and Otis IQ.

actual conduct and to base their ratings on such behavior rather than on general impression.

Only the correlation of ratings with Otis scores appears at all significant, and this is not high enough to be generally considered useful. Otis scores, however, compared with ratings as shown in Figure 1 suggest more strongly that an intelligence test score could be usefully employed as a minimum requirement for placement on supervisory jobs. If the minimum IQ were set at 101 there are no cases below this which are rated unsatisfactory, while there are 15 rated average or above. Eight of the 27 with IQ below 101 are rated unsatisfactory.

A similar comparison between rating and school grade reached does not show as useful results. Although no supervisor who finished high school is rated unsatisfactory, there are only six who completed high school.

Supervisors are more interested in people and business than in science or language according to Thurstone's analysis of the Strong Vocational Interest Blank. There is considerable similarity between the interest of supervisors and successful boy scout masters, policemen, office clerks, and accountants (Table 2). Their interests are quite unlike lawyers, city school superintendents, advertisers, and architects.

THE DEVELOPMENT AND STANDARDIZATION OF THE CHICAGO NON-VERBAL EXAMINATION[1]

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PART I

IT is fairly generally conceded that verbal intelligence tests, such as the Otis, the Army Alpha, the National, the Haggerty Delta II, and the Kuhlmann-Anderson, discriminate against children who have had difficulty in acquiring the English language. Children from homes where a foreign language is spoken or from homes, communities, or institutions where there is a meagre and limited use of the English language, children with reading difficulties, children who are deaf or hard of hearing, and children who have difficulty in manipulating verbal concepts are handicapped in varying degrees when given these verbal tests. These children constitute a fairly large proportion of the population in most large urban communities.

The various performance tests such as Pintner and Paterson's Scale of Performance Tests, Grace Arthur's Point Scale of Performance Tests, the Cornell-Coxe Performance Ability Scale, and the Ferguson Form Boards are instruments which can be used when verbal and language difficulties are present.

[1] The author wishes to acknowledge the splendid co-operation he has received from the teachers and principals of the Chicago Public Schools. Special thanks are due Dr. Grace E. Munson, Director of the Bureau of Child Study. The author also acknowledges the technical assistance of Mr. Seymour Stein, Mr. Perry Rohrer and Miss Mary Dandridge. Thanks are also due W. P. A. for assistance in this work.

Studies from the Institute for Juvenile Research, Chicago, Paul L. Schroeder, M.D., Director. Series C, No. 305.

These tests, however, often involve a speed-of-motor-performance factor which may, especially at the upper age levels, be confused with intellectual ability. Moreover, these tests cannot be given to more than one child at a time. Of the non-verbal group intelligence tests of the pencil and paper type, such as Pintner's Non-Language Tests, the Army Beta, the Myers Mental Measure, and the various primary intelligence tests, only those by Pintner are completely "Non-Verbal," *i.e.*, can be given with pantomime directions.

I. PRELIMINARY INVESTIGATION

The primary purpose in the development of this test has been to devise an instrument which would give a measure of general intelligence and which at the same time would be as free as possible from verbal concepts. Such a test should be applicable to deaf children, to children who come from homes where a foreign language is spoken, to children who may have other language or reading difficulties, and to adults with similar handicaps.

In selecting the test material the authors attempted to adhere to the usual methods and in addition had the following criteria in mind:

1. The tests should be of such a nature that they could be administered by pantomime directions.
2. The pantomime directions should be simple enough to be understood by first or second grade children.
3. The test material should be adaptable to a wide range of difficulty, *i.e.*, each subtest should contain material easy enough for six-year-olds and sufficiently difficult for superior adults.
4. The tests should be administered with as little equipment as possible.

With these general criteria in mind the various intelligence tests of a non-verbal nature were reviewed. Twenty different types of test material were selected. These tests were first tried out on small classes of deaf children in the Chicago Public Schools in order to determine whether or not they could

be given to young children by pantomime directions. On the basis of this initial experimental work a number of otherwise good tests were eliminated. For example, the non-verbal analogies test of the Psychological Examination prepared by the Thurstones has proven to be a good test of a certain kind of intelligence, but it was impossible to devise any type of pantomime direction which would give deaf children an understanding of what they were to do on this type of test material. Such abstractions as are contained in the Thurstones' analogies test seem to be foreign to the experience of the deaf child.

The ten tests finally selected were those which so far as the authors could determine best fulfilled the criteria already mentioned. They required the following performances: (1) learning to associate digits with symbols, (common digit-symbols test); (2) marking out what does not belong in a series of pictures or designs; (3) counting the number of blocks in a pile; (4) selecting from a series of geometrical forms two which can be put together to make a given form; (5) selecting from a series of designs one which is just like a given design; (6) arranging the parts of a picture to make a complete picture; (7) numbering pictures according to a certain sequence; (8) marking the thing that is wrong in each of a number of pictures; (9) selecting from a series of pictures the one that goes with or is part of a given picture; (10) learning of a more difficult type similar to that in (1).

Once we had ascertained that these tests could be given by pantomime directions to deaf children, our next task was to modify and extend the tests and combine them into a battery.

A preliminary form of this battery of tests was first tried out with verbal directions on groups of children in the third, fourth, and fifth grades in a public school. A short time later the battery was given again to the same children. The correlation between the two sets of test scores gave a reliability coefficient of $.92 \pm .01$ ($N = 115$). The high correlation is partially a reflection of the wide age range.

This form of the test along with the Pintner Non-Language Test and the Arthur Point Scale of Performance Tests was used in a survey of the children in the Illinois School for the Deaf. The correlation between the raw scores on this form of the test and the Pintner Non-Language Mental Tests on 388 deaf children who ranged in age from ten to twenty years was $.82 \pm .01$. This correlation was somewhat distorted by the selection of cases. All of the ten-, eleven-, twelve-, and thirteen-year-old children in the school were examined on both tests, but above age thirteen only those children were examined on the Point Performance Scale who were reported by the teachers to be retarded.

The reliability and intercorrelations for the raw scores between the different subtests on 123 cases in grades 3, 4, and 5 are given in Table 1.

TABLE 1

Reliability and Intercorrelation of the Different Tests in the Battery

Test	1	2	3	4	5	6	7	8	9	10
1	.71	.28	.18	.23	.43	.43	.33	.22	.25	.65
2		.52	.18	.11	.21	.20	.27	.31	.14	.20
3			.53	.27	.34	.32	.31	.30	.15	.13
4				.58	.37	.29	.20	.11	.12	.26
5					.69	.42	.49	.35	.23	.46
6						.68	.45	.21	.24	.36
7							.80	.46	.47	.29
8								.72	.39	.18
9									.66	.35
10										.70

The correlation between the total raw score on this preliminary form and chronological age for 379 deaf children was $.49 \pm .03$. The children ranged in age from ten to twenty-one years. The fact that the oldest children in the school are likely to be the dullest has diminished the size of the coefficient. Moreover, the fact that there is very little increase in the

average test score for the different age groups above fourteen years actually reduced the age range and consequently reduced the correlation.

The next step was to correlate the test with a verbal group intelligence test. For this purpose the Non-Verbal and the Army Alpha test (Bregman Revision) were given to 97 adults in the Illinois State Reformatory. Correlations between these two tests, using different methods of weighting, were obtained as follows:

1. When the scores on the different sub-tests of the Non-Verbal were weighted according to their variability,[2] the correlation was .69 ± .03.
2. When the scores were weighted according to their reliability, the correlation was .67 ± .03.
3. When weighted according to the combined judgment of the authors, using their knowledge of the reliability, variability, the content of the tests, the time allotted to each, etc., the correlation was .71.
4. The correlation between the raw scores was .69 ± .04.

The final method of weighting was that used in 3.

These results were sufficiently encouraging to warrant a revision of the test and an attempt at standardization.

II. REVISION AND STANDARDIZATION OF FINAL FORM

In administering the preliminary form of the test and in analyzing the results it became obvious that a number of changes were necessary.

On several of the tests the time limit was reduced to prevent maximum scores being made by superior adults. Pictures were substituted for geometrical forms in Test 2. The directions for Test 6 were completely revised. It was found convenient to use a drawing (the only equipment necessary for administering) as an aid in giving the test. The method of scoring Test 6 and Test 7 was changed from that of giving

[2] The method of weighting used in 1 and in 2 was that suggested by L. L. Thurstone in his monograph, *The Reliability and Validity of Tests*, University of Chicago Press, 1931.

partial credit to the all-or-none method for each item, as the latter gave a more normal distribution of scores. The relative difficulty of the items of each test was statistically determined by computing the percentages of successes on each item at various age levels. On the basis of these percentages the items in each test were arranged in order of difficulty. In the present form, however, the difference in difficulty between successive items is not the same.

A. *Reliability and Validity*

The reliability of the revised form of the test with verbal directions was determined by both the split-half and test-retest method. The correlation between the odd and even tests for a group of 334 children ages 8 to 13 inclusive when corrected by the Spearman-Brown formula was .89. The retest reliability on a group of 71 cases in grades 4B and 5A was .80.

The reliability of the test by pantomime directions was determined by correlating the scores on odd and even items. The odd and even items were determined as follows: The first item of test one was taken as the odd item in every case, the second item as the even, the third as the odd, the fourth as the even and so on to the last item attempted on test 1. If the last item attempted happened to be odd the first item of test 2 was regarded as even and if the last item attempted was an even then the first item of test 2 was regarded as an odd. This same method was continued for all tests. By this method the chances were even for the first, *i.e.*, the easiest item of each test, to be an odd or even item. The following reliability coefficients were determined. For a group of 114 children, ages 7 and 8 years, the odd-even correlation was $.86 \pm .02$. For a group of 100 children, ages 9 to 12 years the odd-even correlation was $.83 \pm .02$, and for a group of 180 children ages 12, 13 and 14 the correlation was $.88 \pm .01$. When corrected by the Spearman-Brown formula the correlations became .92, .91 and .93 respectively.

As is well recognized, adequate criteria of validity for any

test and especially intelligence tests are difficult to establish. The following criteria, however, are generally accepted: first, certainly an intelligence test should correlate to some degree with maturity or chronological age. What the optimum degree of correspondence should be, however, is not definitely established. Most verbal intelligence tests correlate around .50 to .60. Second, certainly children who are in an institution for the feeble-minded and who are generally recognized to be unable, because of lack of intelligence, to get along in the community should make low scores in relation to other children of their age. Third, the distribution of scores should at least approach the normal frequency distribution, and finally the test should show some correspondence with other tests both verbal and non-verbal which also purport to measure intelligence. These four criteria were used in determining the validity of the test.

1. *Correlation with Chronological Age*

The correlations between each sub-test and chronological age and between total score and chronological age for both

TABLE 2

Correlation between the Various Sub-Tests and C.A. for Verbal and Pantomime Directions. (Ages 7 to 14 inclusive)

Test	Verbal (n = 119)	Pantomime (n = 120)
1	.74 ± .02	.70 ± .03
2	.64 ± .03	.49 ± .04
3	.53 ± .04	.57 ± .04
4	.34 ± .05	.53 ± .03
5	.68 ± .03	.69 ± .02
6	.45 ± .04	.62 ± .03
7	.64 ± .03	.67 ± .03
8	.61 ± .03	.68 ± .03
9	.50 ± .04	.55 ± .04
10	.72 ± .02	.73 ± .02
Total Score	.75 ± .02	.81 ± .02

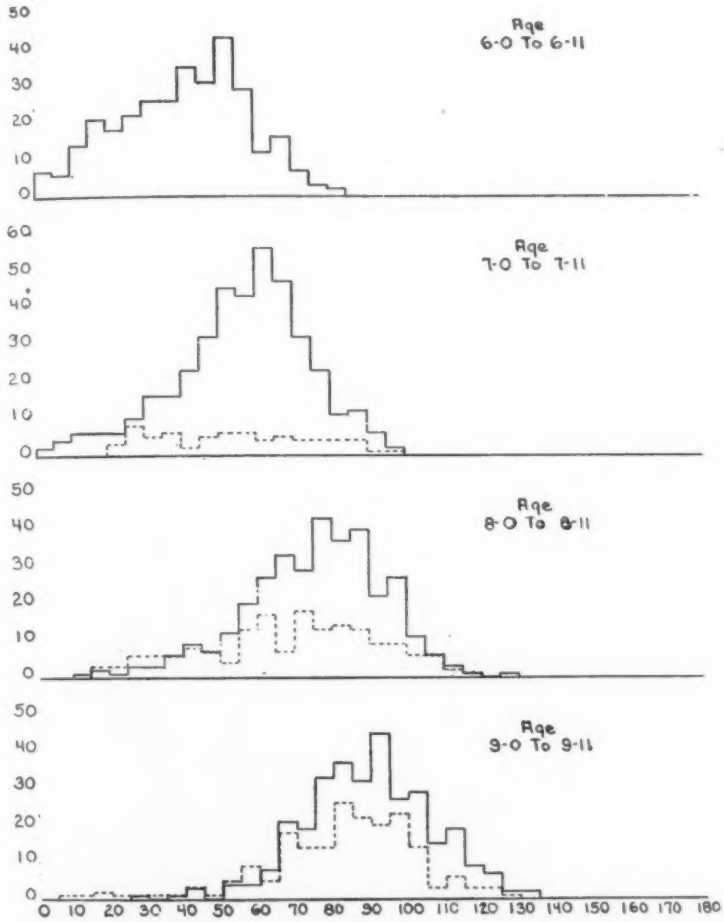

FIG. 1. Distribution of scores for both Verbal and Pantomime Directions.

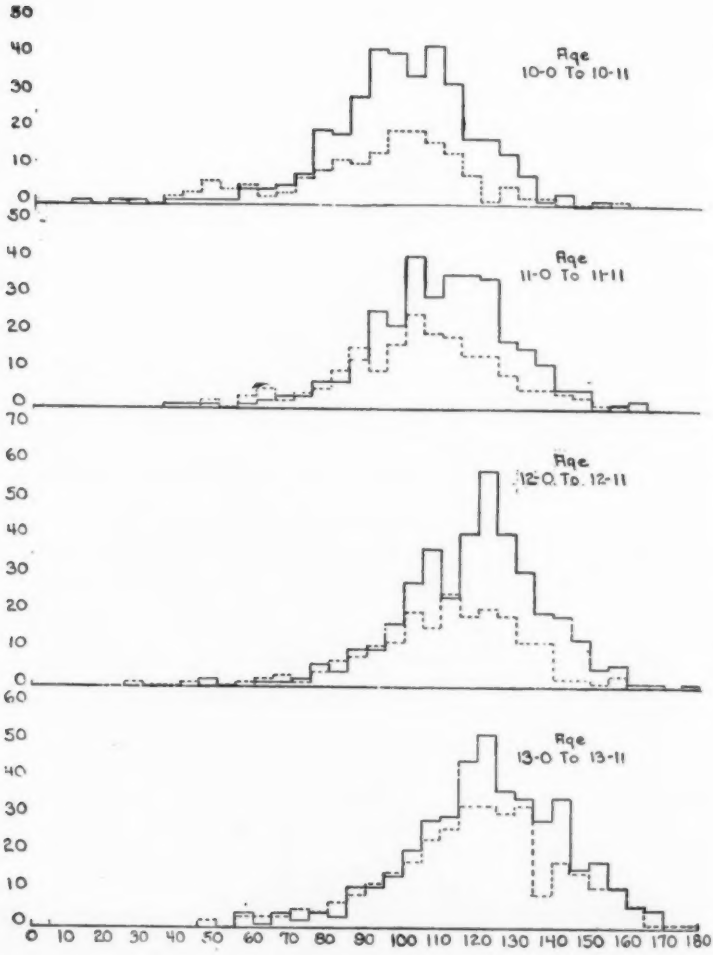

FIG. 1.—(Continued.) Distribution of scores for both Verbal and Pantomime Directions.

verbal and pantomime directions are given in Table 2. On another group of 341 children, age 7 to 13 inclusive, the correlation between total score and chronological age for verbal directions was .64. The correlation between total score and chronological age for pantomime directions on a third group of 280 children, age 8 to 13 inclusive was .57. The higher correlation of chronological age with total score shown in Table 2 is a reflection of the wider age range. These corre-

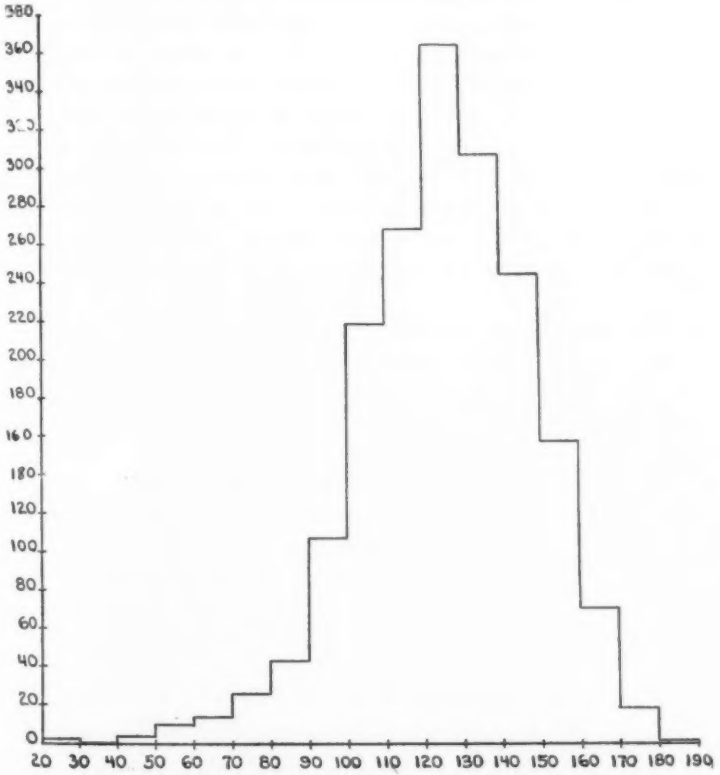

FIG. 2. Distribution of combined raw scores for ages 14–0 and above on both Verbal and Pantomime Directions.

lations, with the two or three exceptions in Table 2, are all fairly high and compare favorably with those between scores and chronological age on other group tests of intelligence.

2. *Results with Mentally Retarded Children*

The test has been given to 35 mentally retarded children at the Institute for Juvenile Research on whom Stanford-Binet ratings were also available. The children were given the Non-Verbal Test because of their low ratings on the Stanford-Binet. The average IQ on the Non-Verbal Examination for this group was 70.2 and on the Stanford-Binet it was 71.5. The average of the differences between the two ratings was 7.3. The test was also given by verbal directions to 99 mentally retarded children at the Lincoln State School and Colony on whom Stanford-Binet ratings were already available. The average IQ on the Stanford-Binet was 62 and on the Non-Verbal Examination the average was 61. The average of the differences between the two ratings was 9 points.

3. *The Distribution of Scores*

The distribution of scores for the various age levels up to 14 years for both verbal and pantomime directions is given in Figure 1. As there was no increase in score for ages 14 and above and as there was no significant difference between the score for verbal and pantomime directions above this age, the scores for ages 14 and above for the two types of directions were combined. The distribution is presented in Figure 2. With the exception of the distribution for pantomime directions at year 7 in which there were only 68 cases these distributions approach the normal frequency surface.

4. *Correlation with other Tests of Intelligence*

A number of comparisons with the results of other tests for both verbal and pantomime directions have been made. The following correlations have been obtained:

Otis, S.A. Intermediate raw score and Non-Verbal raw score $r = .74$, $n = 153$.

Otis, S.A. Intermediate IQ and Non-Verbal IQ $r = .67$, $n = 127$, ages 8 through 15.

Kuhlmann-Anderson IQ and Non-Verbal IQ $r = .57$, $n = 100$, grades 4, 5, and 6.

Kuhlmann-Anderson Mental Age and Non-Verbal Mental Age with Chronological Age constant $r = .51$, $n = 157$.

Otis, S.A. Intermediate raw score and Non-Verbal raw score pantomime directions, $r = .57$, $n = 135$.

Part II of this article will appear in the April issue of this JOURNAL.

THE COMPARATIVE MENTAL EFFICIENCY OF A DRUG ADDICT GROUP

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THE literature on the relation of certain aspects of mental functioning to drug addiction reveals conflicting opinions. For the most part, these opinions are based upon inadequately controlled observations. Kane (6), Krafft-Ebing (8), Jones (5), Savage (5), Scaleth and Kuh (13), Lambert (9), Macklin (10), and Sandoz (12) observe that the use of drugs is a factor in producing intellectual degeneration, marked mental weakness, a suffering of the highest mental functions and a decrease in intellectual efficiency. Kolb (7) and Willcox (14), on the other hand, report that no appreciable intellectual deterioration or abnormal signs may be attributed to chronic abuse of opiates.

The observations cited above are based upon clinical experience. The fact that these opinions are conflicting indicates the need for an objective investigation of certain aspects of mental functioning in drug addicts. Brown's (3) analysis of scores made by incarcerated drug addicts on sub-tests of the Army Alpha Examination indicates that a distinct scoring pattern is a characteristic of the addict group. Tests of word knowledge

[1] The writer desires to express his appreciation to Dr. Lawrence Kolb, who was Medical Officer in Charge, U. S. Public Health Service Hospital, Lexington, Kentucky, for permission to interview patients of this hospital; to Dr. Ralph R. Brown, Psychologist at this hospital, for the facilities of his department used in obtaining the data for this study and for his continued interest and criticism during the investigation; and to Dr. C. K. Himmelsbach, Clinical Director of this hospital, for his excellent editorial criticism and comments.

and previously acquired information were found to be at a much higher relative level than tests of relationships, such as analogies. It has been stated frequently that such a scoring pattern exists in groups showing mental decline.

The purpose of the present study is to investigate the mental efficiency of drug addicts as determined by scores obtained on the Revised Babcock Examination for the Measurement of Mental Deterioration, and to compare these scores with those of a non-addict control group. This problem resolved itself into two divisions, namely:

1. To investigate mental efficiency in the drug addict group and compare their responses with a normal non-addict group.
2. To ascertain whether duration of drug use is significantly related to conditions of mental efficiency in drug addicts.

THE BABCOCK EXAMINATION

The Revised Babcock Examination for the Measurement of Mental Deterioration appears at present to be one of the best means of measuring certain learning, motor and repetition abilities which are sometimes associated with what is called "mental efficiency" and "mental deterioration." Although some psychologists question the validity of the test, it has been demonstrated to be valid in differentiating the so-called "mental efficiency" of improving from non-improving dementia praecox patients (2), and it has likewise differentiated improving from non-improving paretics. Furthermore, Gilbert (4) has demonstrated the value of the method to portray the difference in so-called "efficiency" of normal individuals 20 to 29 years of age as compared with individuals 60 to 69 years of age.

The present study is concerned with comparing the scores obtained by an addict group with those of a non-addict group using the Revised Babcock Examination for the Measurement of Mental Deterioration, rather than demonstrating whether or not "mental efficiency" or "mental deterioration" was measured.

The test measures the discrepancy between the average score on tests which emphasize new learning and speed, and the score on a vocabulary test (Terman's Binet list of eighty words) which requires only previously formed associations and correlates highly with intellectual level. The twenty tests are as follows:

1. Seven questions, mostly of personal information. (Time limit).
   Naming the days—given but not averaged. (Time limit).
2. General information. (Time limit).
   Naming the months—given but not averaged. (Time limit).
3. Counting from 20 to 1. (Time limit).
4. Immediate reproduction of a paragraph.
5. Substitution. (Time limit).
6. Repetition of digits.
7. Reverse digits.
8. Knox cube test.
   Writing name—given but not averaged. (Time limit).
9. Writing "I am going to get well very soon."
10. Tracing a line around a diamond maze rapidly. (Time limit).
11. Retention of a paragraph.
12. Learning paired associates. (Time limit).
13. Pronunciation.
14. Orientation—time. (Time limit).
15. Days reversed. (Time limit).
16. Months reversed. (Time limit).
17. Word Recognition.
18. Drawing designs from memory.
19. Repetition of sentences.
20. Opposites. (Time limit).

Intellectual level is determined by the number of words defined correctly. There is a norm for each intellectual level, the difference between it and the average score on the twenty tests being called the efficiency index. The average of scores on tests 4, 5, 11 and 12 is called the learning score. These learning tests consist of both immediate and delayed recall, quick perception in substitution, and formation of new associations in

learning paired associates. The average of scores on tests 5, 9, and 10 is called the motor score. Coordination of hand and eye as well as speed and accuracy are required in the performance of these tasks. The average of scores on tests 6, 7, and 19 is called the repetition score. An ability to comprehend meaning and get first impressions is essential in the proper execution of these tests. The examination is administered individually and usually requires about an hour.

SUBJECTS

One hundred fifty-six incarcerated, male drug addicts, abstinent for at least six months, and ranging in age from 18 to 68 years (average 35.9 years, standard deviation 14.03) were tested. They were informed that the test was a routine institutional procedure in order that maximum cooperation could be obtained. Cooperation was very good as evidenced by the fact that only one subject refused to take the test, (later he requested to take it). The motivation of the subjects was good as observed by the fact that each entered actively into the task assigned.

The normal, non-addict control group is Babcock's 264 subjects. This sampling of a representative normal population appeared to be considerably more adequate for comparative purposes than any of the groups available. This choice obviated any loaded sampling and made possible direct comparisons with original norms. It is recognized, however, that the differences obtained may be due to techniques of the examiner or environmental testing conditions; but inasmuch as test instructions were rigidly followed and since both the addict and Babcock groups were tested under somewhat similar conditions, it is felt that the lack of an additional control does not seriously influence the results.

RESULTS

Table 1 presents a comparison of the Babcock normal group with the addicts on the average efficiency index. A high negative efficiency index appears to be characteristic of the addict

group. The average efficiency index of −2.28 is significantly below the average of Babcock's normal group, being 15.20 times its standard error. The deficits of the young and old addicts are also significantly below the average of Babcock's normal group, being 8.18 and 11.54 times their standard errors respectively. The difference in the young and the old addict groups, 0.96, is 2.75 times its standard error, and is of interest in showing that the extent of discrepancy occurring in the old group is statistically significant.

TABLE 1

Average Efficiency Index

	No.	Average	S.D.	Diff.	Diff/S.D.Diff.
Babcock	264	0.0	1.18		
All Addicts	156	−2.28	1.64	−2.28	15.20
Young Addicts	34	−2.03	1.36	−2.03	8.18
Old Addicts	34	−2.99	1.50	−2.99	11.54
Young & Old Addicts				− .96	2.75

The total test scores were broken down into learning, motor and repetition scores in order to observe the role which each function may have played in determining the total efficiency index. Table 2 presents a comparison of the Babcock normal group with the addicts on the average learning score. Deficiency in learning ability as measured by the learning score appears to be quite marked in the addict group when compared with the normal Babcock group as shown by the statistically significant differences. It should also be noted that the extent of deficiency in learning ability is considerably greater in the old addict group. The difference of 2.6 is 2.99 times its standard error.

Table 3 presents a comparison of the Babcock normal group with the addicts on the average motor score. From this table it is apparent that the addict group is also deficient in motor ability. The differences are statistically significant. The extent of deficiency in motor ability is considerably greater in the

TABLE 2

Average Learning Score

	No.	Average	S.D.	Diff.	Diff/S.D.Diff.
Babcock	226	14.0	3.48		
All Addicts	156	11.3	4.14	−2.7	6.68
Young Addicts	34	12.7	3.33	−1.3	2.11
Old Addicts	34	10.1	3.82	−3.9	5.61
Young & Old Addicts				−2.6	2.99

old as compared with the young addict group. The difference of 1.8 is 2.77 times its standard error.

TABLE 3

Average Motor Score

	No.	Average	S.D.	Diff.	Diff/S.D.Diff.
Babcock	226	14.0	3.15		
All Addicts	156	11.9	3.18	−2.1	6.36
Young Addicts	34	12.9	2.55	−1.1	2.27
Old Addicts	34	11.1	2.86	−2.9	5.53
Young & Old Addicts				−1.8	2.77

With reference to the repetition score, however, it may be noted from Table 4 that there is no significant difference between the total addict group and Babcock normals, nor is there any significant difference between young and old addicts. The difference between the old and young addicts of 0.1 is only 0.12 times its standard error.

TABLE 4

Average Repetition Score

	No.	Average	S.D.	Diff.	Diff/S.D.Diff.
Babcock	226	13.3	3.30		
All Addicts	156	13.0	3.56	−0.3	0.83
Young Addicts	34	12.8	3.29	−0.5	0.83
Old Addicts	34	12.7	3.53	−0.6	0.93
Young & Old Addicts				−0.1	0.12

That length of drug use might be responsible, in part at least, for the observed score discrepancies in the addict group tested was a possibility which deserved consideration. In order that some idea concerning this possibility could be obtained, nine young addict subjects, with an average reported duration of drug use of ten months, were matched with nine other addict subjects, with an average reported duration of drug use of seven years and four months, for age and intellectual level. The range of duration of drug use for the former was from two to eighteen months. The range of duration of drug use for the latter was from five to eleven years. The average ages of these groups were 27.4 and 27.7 years respectively; the average intellectual level for each group was 15.8. The difference in efficiency index for the two groups of 0.53 was only 0.84 times its standard error; the difference in learning score of 0.06 was only 0.03 times its standard error; the difference in motor score of 0.08 was only 0.60 times its standard error. Since these results seemed to indicate that length of drug use is not a factor in affecting the efficiency index, learning, motor and repetition scores, correlations were made between length of drug use and efficiency index, learning, motor and repetition scores, with chronological age and vocabulary mental age held constant.

Table 5 presents these partial correlations. It will be observed that they are statistically unreliable. However, there is a slight directional tendency for reported length of drug use, per se, to adversely affect efficiency index, learning and motor scores as shown by the negative partial correlations obtained.

TABLE 5

Partial Correlations

	Eff. Index	Learning	Motor	Repetition
Length of drug use, chronological age and voc. mental age constant	−.13	−.15	−.08	.07

DISCUSSION

The particular level of mental functioning for the drug addict group as a whole, as measured by the efficiency index, is comparable to that which Babcock observed in pathological subjects who were unable to make a satisfactory extra-institutional adjustment. When compared with the average of Babcock's normal group, the significant loss of the addict group as a whole (2.7), of the young group (1.3), and of the old group (3.9) as well as the significant loss of the old group when compared with the young (2.6) on average learning score, in contrast with the insignificant losses on repetition scores in all these groups is an observation similar to that made by Gilbert (4) when comparing scores derived from similar test material. This seems to indicate that the deficient scoring in the addict group is not in the ability to attend to new material and to hold new impressions, but rather is an inefficiency in the ability "to form new associations fundamental to the learning of meaningful material or the reproduction of material beyond the length of simple memory span" (2). The significant difference between the old and the young addict group in respect to learning, as measured by these tests, seems to agree with the results reported by Miles (11) in a study of the change of learning function with increasing maturity. When compared with the average of Babcock's normal group, there is a significant loss of the addict group as a whole (2.1), of the young group (1.1), and of the old group (2.9) as well as a significant deficit of the old group over the young (1.8) on the average motor score. A possible explanation that suggests itself is that of a particular motor deficiency in the addict group as a whole existing prior to drug use. The discrepancy in motor efficiency between the young and old addict groups would seem to find support in numerous studies (11) which have shown decreases in motor efficiency with increasing maturity. These results may be interpreted as quantitatively confirming the qualitative clinical picture of the drug addict in respect to his many inadequacies

and inability to cope with difficulties, which is generally emphasized in the clinical literature.

The data of the present study do not offer conclusive evidence in regard to the problem of the effect of the duration of drug use upon certain aspects of mental functioning already described, but some evidence is presented supporting the hypothesis that the duration of drug use does not account for the high negative efficiency index and the discrepancies in learning and motor responses as measured by the tests used. In this connection, it should be recalled that the data in Table 5 showed that when efficiency index, learning, motor and repetition scores were correlated with length of drug use, holding chronological age and vocabulary mental age constant, partial coefficients of $-.13$, $-.15$, $-.08$ and .07 were obtained. It should be borne in mind that certain limitations exist with respect to this data. Such factors as kinds and dosages of drugs used, number of withdrawals, as well as the actual duration of drug use could not be practically procured and therefore could not be considered. However, the statistically unreliable partial correlations obtained seem to indicate that reported length of drug use, per se, is not a significant factor in affecting the scores of the addict group. Since length of drug use does not seem to be a significant factor in affecting efficiency index, learning, motor and repetition scores, the possible interpretation of the deficient scores, when compared with the Babcock normal group, is that the deficiency with respect to the aspects of mental functioning described existed prior to drug use and may have been an important contributory factor in the development of the drug habit.

CONCLUSIONS

The following conclusions appear to be justified under the conditions of this study:

1. Young addicts, as well as old, are significantly lower than a normal, non-addict group on the Babcock efficiency index.

2. Drug addicts are significantly deficient in the Babcock tests of learning and motor abilities.

3. Old addicts are significantly more deficient than young addicts in the Babcock efficiency index.

4. Old addicts are significantly more deficient than young addicts in the Babcock tests of learning and motor abilities.

5. Duration of drug use is apparently not a significant factor affecting mental efficiency as measured by the Babcock tests.

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THE CORRELATION BETWEEN ACHIEVEMENT SCORES AND SCHOOL MARKS IN AN INDEPENDENT SCHOOL FOR BOYS

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A PROCEDURE that is frequently used for appraising tests of achievement in academic subjects is the correlation of scores on the tests with school marks. It is reasonable to assume that if the results of a test of achievement in a given subject are not fairly highly correlated with marks in that subject, the test is lacking in validity. Conversely, if the test does have rather high correlation with marks, there is at least some evidence that the test measures what it was designed to measure.

However, one cannot expect the correlation between test scores and school marks to be extremely high. Hundreds of studies have shown that marks are notoriously unreliable as indices of achievement. In fact, the very unreliability of marks has been one of the main bases for the development of tests. A teacher need only recall the number of pupils in his classes that are on the borderline between, let us say, B and C, in order to realize that the assigning of some of the pupils to either category is at best an uncertain and arbitrary procedure. The unreliability of marks, of course, tends to lower their correlation with all types of tests. The reliability varies with the number of marking periods included. Marks based on one term are obviously less reliable than marks covering the whole year's work.

A second reason for the lack of very high correlation between

marks and test scores is that tests presumably measure achievement, whereas marks almost inevitably include a variety of factors in addition to achievement. Industry, attention to class activities, perseverance, citizenship, sincerity of purpose, and many other personality characteristics often enter into marks, even though teachers consciously try to evaluate achievement alone.

In any study of the correlation between test scores and school marks it is highly desirable to keep in mind the limitations of marks as criteria of achievement. If these limitations are taken into consideration, data on the relationship of tests and marks may be very helpful to one who is attempting to form an opinion concerning the value of the tests.

A study of the correlation of scores on the Cooperative Achievement Tests with marks in eight independent schools for boys was reported in Educational Records Bulletin Number 19, published in January, 1937.[1] One of the findings in that study was that the median of 121 correlations was approximately .72 and that all but two of the correlations were statistically significant. In a supplementary study reported later it was shown that the median partial correlation between the achievement test scores and the school marks, with intelligence held constant, was .57.[2]

A limiting factor in the study was that since the school marks were assigned to the pupils after the tests had been administered, use of the test results in marking may have raised the correlation to some extent, although statements received from the schools indicated that the use of test scores in assigning marks was not extensive. Even though they had no definite plan for basing marks on test results, some teachers

[1] Arthur E. Traxler, "Comparable Tests and School Marks," *1936 Fall Testing Program in Independent Schools and Supplementary Studies*, pp. 83–111. Educational Records Bulletin No. 19. New York: Educational Records Bureau, 1937.

[2] Arthur E. Traxler, "Correlation of Achievement Scores and School Marks," *School Review*, XLV (December, 1937), 776–80.

may have unconsciously been influenced by the test scores of their pupils.

In any event, it seems desirable to investigate the relationship between scores on the Cooperative tests and school marks under conditions where the marks could not have been affected by the test results. These conditions have been met by the school marks and test scores obtained in the spring of 1939 from an independent school for boys. The marks were assigned by the teachers at the end of the second term of the school year 1938–39. After the marks had been given, the Cooperative Achievement Tests, Form P, were administered in the fields of literary comprehension, French, German, Latin, mathematics, and science. The test scores thus obtained were correlated with the second term marks.

The marks were in terms of the categories A, B, C, D, and E. In the computation of correlations between a qualitative marking system and a quantitative series of test scores, an approved statistical procedure is to translate the qualitative series of marks into a quantitative one by representing the data on a normal scale and making use of the means of the pieces expressed as sigma deviation from the mean. However, that procedure is rather long and time-consuming and since sample checking of several correlations indicated that the correlations obtained by this method were not significantly different from those resulting from an ordinary product-moment method, in which values of 1, 2, 3, 4, and 5 were assigned to the marking categories, the simpler method was used. The correlation coefficients resulting from the use of this method are shown in Table 1.[3]

[3] It was not feasible to compute correlations for fourth year German and one class of first year German because of the small number of pupils. In the case of first year German, there were three groups: German I, consisting of tenth grade pupils who took the elementary test; German I S, consisting of ninth grade pupils who also took the elementary test; and German I A, consisting of a few eleventh and twelfth grade pupils who took the advanced test. Correlations have been reported in the table for German I and for German I and I S combined.

TABLE 1

Correlations Between Second Term Marks, 1938–39, and Scores Made in March, 1939, on Cooperative Tests, Form P, by Students in An Independent Secondary School for Boys

Subject and test	No. of pupils	r	P.E.
English I & Literary Comprehension—Speed	68	.389	±.069
" I & " " —Level	68	.444	±.066
" II & " " —Speed	132	.459	±.046
" II & " " —Level	132	.453	±.047
" III & " " —Speed	183	.478	±.039
" III & " " —Level	183	.502	±.037
" IV & " " —Speed	183	.361	±.043
" IV & " " —Level	183	.407	±.042
Average		.437	
French I & French Test, Elementary	107	.664	±.037
" II & " " Advanced	136	.518	±.042
" III & " " "	180	.540	±.036
" IV & " " "	72	.400	±.067
Average		.531	
German I & German Test, Elementary	21	.795	±.054
" I+I S & " " "	26	.771	±.054
" II & " " Advanced	21	.800	±.053
" III & " " "	30	.801	±.044
Average		.791	
Latin I & Latin Test, Elementary	90	.711	±.035
" II & " " Advanced	122	.678	±.033
" III & " " "	84	.649	±.043
" IV & " " "	26	.537	±.094
Average		.644	
Mathematics I & Elementary Algebra	66	.724	±.040
" III & Intermediate Algebra	120	.551	±.043
" III & Plane Geometry	116	.594	±.041
" III A & Plane Geometry	35	.735	±.052
Average		.651	
Biology and Biology Test	47	.531	±.071
Chemistry II & Chemistry Test	42	.690	±.055
Chemistry III & Chemistry Test	55	.640	±.054
Physical Science II & Chemistry Test	11	.864	±.046
Physical Science II & Physics Test	11	.361	±.177
Physics II & Physics Test	29	.589	±.082
Physics III & Physics Test	61	.576	±.058
Average		.607	
Average (omitting Literary Comprehension Speed)		.612	

The correlations in Table 1 are reduced somewhat by the fact that the marks are grouped in broad categories. There

are several formulae for correcting correlations for broad grouping, but in view of the fact that the reduction is not very great and the further fact that the marks are not highly reliable, it seemed unnecessary to apply a refined statistical procedure of this kind to the data. It should be remembered, however, that the correlations as given in the table are a little too low.

In interpreting the correlations for the English classes one should keep in mind the fact that these correlations are between marks in English and a test of literary comprehension, that is, a test of ability to read literary materials. Obviously, one would not expect these correlations to be very high. Data in other studies have indicated that correlations between marks in English and literary comprehension scores are considerably lower than correlations of English marks with scores on the Cooperative English Test, which measures usage, spelling, and vocabulary.

However, it is interesting to observe that all the correlations between the marks in English and the literary comprehension scores are significantly positive. There are no large differences between the correlations for speed and for level, which fact is not surprising, since it is known that speed and level scores on this test are themselves very highly correlated. In general, the level scores seem to be a little more closely related than the speed scores to marks in English.

Most of the correlations between test scores and marks in the other subjects are fairly high. In the foreign languages, the correlations for German and Latin tend to be considerably higher than those for French, although the correlation between marks in French I and scores on the elementary form of the French test compares favorably with the Latin correlations. In both French and Latin, the correlations for the fourth year class are lower than those for the other three classes. This is probably due to the fact that in this school the achievement of the Latin and the French students was so high that the better

students in the fourth year were not adequately measured by the tests.

In the field of mathematics, the correlation of scores on the elementary algebra test and marks in Mathematics I is rather high. Likewise, the correlation of the scores on the plane geometry test and the marks in Mathematics III A is quite high. In Mathematics III, the marks show considerably less correlation with the intermediate algebra test and the plane geometry test.

The correlations of the test scores and marks in the field of science vary over a wide range. In general, the ones for chemistry are considerably higher than those for biology and physics. All the correlations are significant except the one for marks in Physical Science II and scores on the physics test, but the fact that only eleven cases were included makes this correlation of doubtful value. On the other hand, the highest correlation in the entire table, .864, is the one for marks in Physical Science II and scores on the chemistry test, but again the small number of cases limits the importance of the correlation.

Although the averaging of correlations is not an entirely defensible statistical procedure, an average correlation was found for each subject field and also an average for the entire list of subjects and tests. To avoid giving the literary comprehension test too much weight in the average for the whole table, the speed of comprehension correlations were omitted. It will be observed that from the standpoint of size of average correlation between marks and test scores, the order of the subject fields is as follows: German, mathematics, Latin (not significantly different from mathematics), science, French, and literary comprehension. The average of twenty-seven correlations, .617, is fairly high. It indicates that there is in general considerable agreement between the Cooperative test scores and the marks in this independent school.

LONGEVITY RELATIONSHIPS BETWEEN THE MENTALLY ABNORMAL AND THEIR PARENTS

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STATEMENT OF THE PROBLEM

THOROUGH investigations have indicated that heredity is an important factor in the biological determination of longevity. These earlier studies have dealt with persons who were supposed to be mentally normal. Of the great amount of statistical work done on the mortality of the mentally abnormal, little or no attention has been given to heredity as a determiner of longevity. The aim of the present investigation is to determine what relationships exist between the longevity of mental patients and the longevity of their parents.

PREVIOUS STUDIES

The studies of Raymond Pearl are the outstanding scientific evidence that heredity plays an important part in the biological determination of longevity (4, 5).[1] Beeton and Pearson (1) in 1901 found significant kinship correlations. Yuan (6) has already reviewed the findings and the limitations of these studies on the inheritance of longevity in the normal population.

METHOD OF GATHERING DATA

The cases included in this study are patients diagnosed as

[1] Numbers in parentheses refer to entries in the bibliography.

schizophrenic or manic-depressive psychosis who died recently in the state hospitals for the insane at Columbus, Athens, and Dayton, Ohio. These two psychoses were chosen for investigation because of their relative numerical importance.

The procedure in collecting the data was to copy from the hospital office files the case history number of each schizophrenic or manic-depressive patient who had died during the year. Then the case history record for each patient was examined to determine: (1) age of the patient at death, (2) age of the patient's mother at the time of her death, (3) age of the patient's father at the time of his death. Many cases did not yield complete data because the father or mother or both would be living at the time the patient was admitted to the hospital.

RESULTS

The fact that age for only one parent was known in some cases made it necessary to get statistical constants for two groups: one in which the age of patient and age of mother are known, and another in which age of patient and age of father are known. The data for schizophrenia and for manic-depressive psychosis were treated separately. Also, the data from the three hospitals were treated separately and then finally were combined into a total schizophrenic group and a total manic-depressive group. Preliminary analysis of the

TABLE 1

Mean Ages at Death for Patient and Father

	Columbus	Athens	Dayton	Total
Schizophrenia	Mp = 54.56 Mf = 65.33 N = 69	Mp = 53.34 Mf = 65.24 N = 29	Mp = 44.48 Mf = 58.41 N = 31	Mp = 51.87 ± 1.42 Mf = 63.65 ± 1.19 N = 129
Manic-Depressive	Mp = 60.76 Mf = 68.95 N = 42	Mp = 60.02 Mf = 63.47 N = 46	Mp = 53.15 Mf = 67.50 N = 44	Mp = 57.97 ± 1.23 Mf = 66.56 ± 1.29 N = 132

data indicated that it was not necessary to complicate the results further by treating males and females separately.

Table 1 shows mean ages at death for patient and father. Fathers of patients live to be significantly older than the patients. The difference between the mean for schizophrenic patients and the mean for their fathers, divided by the standard error of that difference gives a critical ratio of 6.36. The corresponding critical ratio for manic-depressive patients is 4.83.

Table 2 gives the corresponding relationships between age

TABLE 2

Mean Ages at Death for Patient and Mother

	Columbus	Athens	Dayton	Total
Schizophrenia	Mp = 53.52 Mm = 61.27 N = 69	Mp = 56.69 Mm = 64.46 N = 13	Mp = 43.38 Mm = 50.81 N = 21	Mp = 51.85 ± 1.63 Mm = 59.54 ± 1.69 N = 103
Manic-Depressive	Mp = 59.66 Mm = 63.70 N = 47	Mp = 60.28 Mm = 63.59 N = 39	Mp = 55.77 Mm = 64.02 N = 39	Mp = 58.64 ± 1.24 Mm = 63.77 ± 1.41 N = 125

of patient at death and age of mother at death. As one might expect, mothers of patients live to be significantly older than patients. The critical ratio for schizophrenic patients is *3.27*, and for manic-depressive patients, *2.73*.

Tables 3 and 4, in which are recorded the standard deviations for these groups, show that patients with schizophrenia are more variable in length of life than patients with manic-depressive psychosis.

Table 5 reveals that the group for which age of mother at death is known is very similar to the group for which age of father at death is known. The two groups overlap to some extent. There are 157 cases for which age at death is known for both parents. These 157 cases were not treated as a separate group but were included in the groups "Age of Father known" and "Age of Mother known."

TABLE 3

Standard Deviations for Ages of Patient and Father at Death

	Columbus	Athens	Dayton	Total
Schizophrenia	σp = 15.48 σf = 11.32 N = 69	σp = 15.62 σf = 15.49 N = 29	σp = 15.60 σf = 14.41 N = 31	σp = 16.09 σf = 13.46 N = 129
Manic-depressive	σp = 13.07 σf = 12.52 N = 42	σp = 12.44 σf = 16.79 N = 46	σp = 15.60 σf = 13.92 N = 44	σp = 14.18 σf = 14.77 N = 132

TABLE 4

Standard Deviations for Ages of Patient and Mother at Death

	Columbus	Athens	Dayton	Total
Schizophrenia	σp = 17.39 σm = 17.11 N = 69	σp = 8.68 σm = 13.55 N = 13	σp = 14.43 σm = 16.26 N = 21	σp = 16.55 σm = 17.14 N = 103
Manic-depressive	σp = 13.79 σm = 15.88 N = 47	σp = 13.59 σm = 16.19 N = 39	σp = 13.81 σm = 15.28 N = 39	σp = 13.87 σm = 15.79 N = 125

TABLE 5

Statistical Constants for Abnormal Groups

	Mother known	Father known
Schizophrenia	Mean = 51.85 σ = 16.55 N = 103	Mean = 51.87 σ = 16.09 N = 129
Manic-depressive	Mean = 58.64 σ = 13.87 N = 125	Mean = 57.97 σ = 14.18 N = 132

The statistical constants throughout the study were computed by gross score formulae. Table 6 shows correlations between age of patient at death and age of father at death.

TABLE 6

Correlations between Age of Patient at Death and Age of Father at Death

	Columbus	Athens	Dayton	Total
Schizophrenia	.380 ± .069 N = 69	.311 ± .113 N = 29	.289 ± .111 N = 31	.372 ± .051 N = 129
Manic-depressive	− .034 ± .104 N = 42	.324 ± .089 N = 46	− .029 ± .102 N = 44	.086 ± .058 N = 132

The correlation for the total group is significantly higher for schizophrenia than for manic-depressive psychosis. The critical ratio is *2.49*. This may be interpreted to mean that the chances are *155* to *1* that there is a higher relationship between longevity of patient and longevity of father for schizophrenic patients than there is for manic-depressive patients.

Table 7 contains the correlations between age of patient at

TABLE 7

Correlations between Age of Patient at Death and Age of Mother at Death

	Columbus	Athens	Dayton	Total
Schizophrenia	.617 ± .050 N = 69	.866 ± .047 N = 13	.401 ± .123 N = 21	.617 ± .041 N = 103
Manic-depressive	.189 ± .095 N = 47	.428 ± .088 N = 39	.369 ± .093 N = 39	.314 ± .054 N = 125

death and age of mother at death. Again the correlation is higher for schizophrenic than for manic-depressive patients. The difference between these two correlations (.617 and .314) divided by the standard error of that difference yields a critical ratio of *3.00*. So we may say that the chances are more than *700* to *1* that there is a higher relationship between longevity of patient and longevity of mother for schizophrenic patients than there is for manic-depressive patients. Table

8, a summary of Tables 6 and 7, will facilitate comparisons.

Table 8 shows that the kinship correlations are higher for schizophrenia than for manic-depressive psychosis. It also

TABLE 8

Comparison of Kinship Correlations

	Father and patient	Mother and patient
Schizophrenia	.372 ± .051 N = 129	.617 ± .041 N = 103
Manic-depressive	.086 ± .058 N = 132	.314 ± .054 N = 125

appears that longevity relationships are higher between patient and mother than between patient and father. The odds that this is a true difference are *28* to *1* (critical ratio = *1.82*) for the manic-depressive group and *168* to *1* (critical ratio = *2.52*) for schizophrenia.

It is important to note that because of the way in which the data were collected, the findings of this study indicate the relationship that obtains between longevity of patient and parent only for cases where the parent was deceased at the time the patient was admitted to the hospital. Patients whose parents were living at the time of admission were necessarily excluded from the study because of lack of data. This requirement resulted in restricting the range of the parents' ages. The correlations presented in Table 8 are somewhat higher than they would have been if it had not been necessary to reject cases where both parents were living at the time of admission of the patient to the hospital.

This factor of selection would seem to account in part for the higher kinship correlations for schizophrenia than for manic-depressive psychosis. Patients with schizophrenia enter hospitals at an earlier age than do manics. A larger proportion of schizophrenics, therefore, would have to be eliminated because both parents would be living at the time of

admission. It is important to know to what extent the correlations were affected by this condition. To throw light on this problem the data were put into double-entry tables. Tables 9, 10, 11 and 12 are double-entry tables containing all the data of this study grouped in intervals of five years.

TABLE 9

Double-Entry Table Containing Patient-Father Data for Manic-Depressive Cases

	Manic-depressive patient's age at death														
Father's age at death	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89	f
90–94									1	2					3
85–89				1		1		1				1			4
80–84				1	1	3	1	1	2	4		4	1		18
75–79					1	1	2	2	4	6	2				18
70–74	1		2			5	1	6	6	3	2	4			30
65–69				2	1	3	1		1	2	1	1			12
60–64			1	1	1		1	1	1	1		2			9
55–59		1	1	2				2	1		1	1	1		10
50–54		1			1			2	3			1		1	9
45–49				1		2	1		1				1		6
40–44				1	1				1			2			5
35–39					1	1		1			1		1		5
30–34											1				1
25–29							1								1
20–24				1											1
f	1	2	4	10	7	16	8	16	21	18	8	16	4	1	N = 132

These double-entry tables will not give exactly the values of kinship correlations presented in Table 8 because the correlations in Table 8 were computed by gross score formulae. These double-entry tables show that rejecting cases where at least one parent was not dead at the time of admission did not result in seriously limiting the range of parents' ages.

It is certain, however, that the average age at death for parents in this study is less than the average age at death for

TABLE 10

Double-Entry Table Containing Patient-Mother Data for Manic-Depressive Cases

Mother's age at death	Manic-depressive patient's age at death														f
	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89	
90–94									1		1	1			3
85–89						1			1			3			5
80–84						2	1	2	3	1		2	1		12
75–79				1		1	1	3	3	3		3			15
70–74			1			3	2	2	2	6	1	3			20
65–69					2			3	3	4	4	1			17
60–64			1		3	2	1	1	3		2	1		1	15
55–59				2	1	1	1					1	1		7
50–54			1	1		2		1							5
45–49		1		2	1	1	1		1	1		2			10
40–44	1			1	1					1					4
35–39					1				1		1				3
30–34						1		4					1		6
25–29				1											1
20–24						1			1						2
f	1	1	3	8	9	15	7	16	19	16	9	17	3	1	N = 125

parents of all patients. This characteristic of the data may explain what is, on the surface, a difference between parents of manic-depressives and parents of schizophrenic patients. Table 1 shows that the fathers of manics are about three years older at death than the fathers of schizophrenic patients. Table 2 shows that the mothers of manics are four years older at death than the mothers of schizophrenic patients. This difference may not be a real one. Patients with schizophrenia tend to enter hospitals at an earlier age than do manics. Accordingly, of a group of parents deceased at the time their offspring enter the hospital, the parents of schizophrenic patients will have died at an earlier age. Consequently, it is not safe to conclude that parents of manic-depressive patients

TABLE 11

Double-Entry Table Containing Patient-Father Data for Schizophrenic Cases

Father's age at death	Schizophrenic patient's age at death														f
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	
90–94								1							1
85–89									1						1
80–84				1	1		1		3		4	2	1	1	14
75–79					1		1	5			5	2	1	1	16
70–74				2		1	1	1	5	1	2		1		14
65–69			1	5	3	2	3	2	5	4		1	2		28
60–64		1		2	2		2	1	2	1		2	1		14
55–59		1		1	1	1	2				2		1		9
50–54				2	2		2	1			2	1		1	11
45–49	1		1	1		1	1				1		1	1	8
40–44			1	1			1	2							5
35–39				3	1				1						5
30–34	2					1									3
f	3	2	3	18	11	6	14	13	17	6	16	8	8	4	N = 129

are more longevous than the parents of schizophrenic patients. Parents of patients will never be entirely satisfactory as subjects for longevity studies until hospitals enter in their records the ages at which the parents died even though the patient may have died previously.

Another solution to this problem of the selection of cases might be to use not age of parent at death but simply whether or not he had attained a certain specified age (*e.g.*, 60 years). Then one could compute a bi-serial coefficient of correlation between age of patient at death and age of parent.

CONCLUSIONS

This study is an attempt to determine what relationship exists between the longevity of mental patients and the lon-

TABLE 12

Double-Entry Table Containing Patient-Mother Data for Schizophrenic Cases

Mother's age at death	Schizophrenic patient's age at death														
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	f
95–99													1		1
90–94														1	1
85–89									1		1	1			3
80–84								1	1		4	1	1	1	9
75–79						1	1	3	2		3	1			11
70–74			1		1			2	3	1	2		2	1	13
65–69							3	1	3	1	1	1			10
60–64			1			1	1		2	1			1		7
55–59						1			2		1	1			5
50–54					2	1	2	4	1			2			12
45–49	1			2		2	3	1							9
40–44		1	1	3							1		1		7
35–39	2	1	1	1		1		1							7
30–34	1			1											2
25–29			1		1	1					1				4
20–24				1		1									2
f	4	2	5	8	4	9	10	13	15	3	14	7	6	3	N = 103

gevity of their parents. The kinship correlations are significantly higher for schizophrenia than for manic-depressive psychosis. This paper does not attempt to explain why the hereditary factor in longevity should be more effective in one case than in the other. Malzberg (3) lists the three leading causes of death as heart disease, pneumonia, and tuberculosis for schizophrenia, and heart disease, pneumonia, and exhaustion for manic-depressives. Is heredity more closely related to ability to resist tuberculosis than to ability to resist exhaustion or do manic cases in particular so use up their energy as individuals that hereditary factors are obscured more than in schizophrenia?

This study seems to justify the conclusion that longevity of the patient bears a closer relation to longevity of mother than to longevity of father. Professor Raymond Pearl previously has come to this same conclusion for normal persons.

The kinship correlations in this study are significantly higher than Pearson and Pearl have found for normal persons. These larger correlations may be due, in part at least, to the necessity of rejecting cases both of whose parents were living at the time of the patient's admission to the hospital. It is not clear whether patients tend to live out their normal life span because they are institutionalized, or whether some other factors are operating. A study of longevity relationships among institutionalized normal persons might make this point more clear.

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A COMPARISON OF THE RESULTS OF THE STANFORD AND TERMAN–MERRILL REVISIONS OF THE BINET[1]

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INTRODUCTION

THIS study was initiated as the result of an unusual number of rising IQ's after the Terman-Merrill Revision of the Binet Test was introduced into the testing program of the Wayne County Training School. We were led to question whether or not we could substitute the new Binet for the old where we were interested in the mental growth of the individual child.

DESCRIPTION

The Wayne County Training School is an institution for the Training of moron and borderline defectives who have failed to adjust in the community. In this respect, the children in the School are a selected group. From this group we have taken as our subjects the first 350 cases to have had a Terman-Merrill Binet, Form M, and at least one Stanford Binet. The range, interquartile range and median of the distribution of the chronological ages of the subjects, the Terman-Merrill mental ages and the IQ's from both revisions are delineated below.

[1] This paper, in abbreviated form, was presented before the Psychological Section of the Michigan Academy of Science, Arts, and Letters in Ann Arbor, March 17, 1939. The writer is indebted to Dr. R. H. Haskell, Medical Superintendent of the Wayne County Training School, for the interest which made the study possible.

		Limits of Range	Limits of Middle 50%	Median
C.A.		7 to 26	11 to 16	14
T. M. Form M.	M.A.	4 to 15	7 to 10	8
T. M. Form M.	IQ	33 to 109	59 to 75	68
Stanford Binet.	IQ	33 to 101	59 to 73	68

The IQ was used as the basis of comparison of the two tests. In each case the IQ of the Stanford Revision was subtracted from that of the Terman-Merrill administered to the same child. Deviations were reported as positive when the Terman-Merrill IQ was greater than that of the Stanford Binet, and negative when less.

The intervals between the compared tests range from a few days to three years with the middle 50 per cent from 3 to 19 months inclusive. The median interval is 16 months. In 75 cases the compared tests were given less than one month apart. The effect of familiarity with the test items was eliminated, in part, by carrying over to the second test the scores gained on the first where the item was identical. Since this study was not anticipated at the time of the testing, the order of the tests was not consciously controlled. However, in 44 of the 75 cases the Terman-Merrill was the first of the compared tests to be administered. Since the shortness of this interval may still raise a question as to the influence of one test upon the other, the distribution of the deviations of the IQ's for this interval is compared with that of the 24 to 35 months interval with the following results:

Interval	No.	Limits of Range	Limits of Middle 50%	Median
Below 1 month	75	+12 to −20	+5 to −3	0
24 to 35 months	70	+18 to −12	+7 to −4	+1.5

The coefficients of correlation for the compared IQ's, grouped according to interval, are as follows:

Interval less than 1 month	75 cases	R = +.93 ± .01
Interval 1 to 11 months incl.	34 cases	R = +.88 ± .03
Interval 12 to 23 " "	160 cases	R = +.86 ± .01
Interval 23 to 35 " "	70 cases	R = +.81 ± .03
Interval 36 to 47 " "	11 cases	R. Not computed

FINDINGS

When the differences between the two IQ's were determined, a distribution of the deviations was made for each chronological age from 10 through 17 years. Cases below 10 years were treated as one group since the number was too small at any given age level to warrant separate treatment. The same obtained for chronological ages 18 and above. Table 1 shows the determining points of these distributions.

TABLE 1

Difference in IQ (Terman-Merrill minus Stanford Binet)

C.A.	No.	Limits of Range	Limits of Middle 50%	Median	Avg. Magnitude of Difference
9 & below	33	+ 7 to −20	0 to −7	−2	4.0
10	25	+10 to − 9	+6 to −4	0	4.84
11	41	+13 to −12	+3 to −7	−1	5.34
12	26	+ 8 to −10	+5 to −5	−2	4.8
13	44	+15 to − 9	+2.5 to −5	−1	4.25
7 to 13 Inc.	169	+15 to −20	+3 to −6	−1	4.63
14	49	+20 to −10	+6 to −1	+2	5.10
15	41	+18 to − 6	+8 to 0	+4	5.68
16	41	+16 to −10	+8 to +1	+4	6.04
17	30	+21 to − 6	+9 to +1	+4	6.60
18 & above	20	+11 to − 6	+8 to +2	+4.5	5.3
14 & above	181	+21 to −10	+8 to 0	+4	5.71

When the distributions of the IQ deviations are plotted, the curve for each chronological age up to and including 13

years, with the single exception of 10, shows a slight skewing to the negative end indicating that, in over 50 per cent of the cases, the Terman-Merrill IQ is below that of the Stanford Binet. In this age range, the average magnitude of the difference between the two measures is practically 5 points, an amount which is in keeping with the findings of a previous study (1) where successive Stanford Binets were compared. The correlation coefficient for the Terman-Merrill IQ with that of the Stanford Binet for this group is $+.80 \pm .02$.

Beginning with 14 years, the distribution of the IQ deviations are without exception skewed to the positive end and from 16 years on, the entire middle 50 per cent of the cases appear on the positive side. As a matter of fact, 75.5 per cent of the deviations at chronological age 16, 86.6 per cent at 17, and 85 per cent at 18 have a Terman-Merrill IQ greater than that of the Stanford Binet. The average difference between the two IQ's for this group, chronological age 14 and above, is practically 6 points. The correlation coefficient for this group is $+.92 \pm .01$.

The change in tendency which the IQ deviations show at chronological age 14 suggests that the method of computing the IQ may be obscuring any true difference between the results of the two tests. It will be recalled that after 13 years of age, according to Terman (3) in his new revision, "we cumulatively drop one out of every three additional months of chronological age and all of it after 16."

In order to test this point, we turned to the Heinis Personal Constant as a basis for comparing the two tests. In an earlier study (2) we found the Personal Constant to give a more consistent picture of mental growth at all ages than the IQ. We now found the difference between the P.C. of the Terman-Merrill and that of the nearest Stanford Binet, just as we did in the case of the IQ, and again made distributions for the different chronological age levels. The results are indicated in Table 2.

Here we see no such skewing of curves as with the IQ.

TABLE 2

Difference in Heinis P.C. (Terman-Merrill—Stanford Binet)

C.A.	No.	Limits of Range	Limits of Middle 50%	Median	Avg. Magnitude of Difference
9 & below	33	+ 4 to −15	+1 to −3	−1	3.0
10	25	+ 7 to − 8	+4 to −2	+1	3.24
11	41	+ 9 to − 8	+3 to −4	−1	3.51
12	26	+ 7 to − 4	+4 to −3	+1	3.3
13	44	+10 to − 6	+2 to −1.5	+1	2.65
7 to 13 Inc.	169	+10 to −15	+3 to −3	0	3.11
14	49	+ 8 to − 4	+4 to 0	+1	2.97
15	41	+10 to − 4	+4 to 0	+1	2.09
16	41	+ 7 to − 7	+2 to −2	+1	2.51
17	30	+ 6 to − 6	+2 to −2	0	2.46
18 & above	20	+ 3 to − 6	+1 to −2	−0.5	1.85
14 & above	181	+10 to − 7	+2 to −1	+1	2.45

From 9 years through 18 the middle 50 per cent of the deviations are more evenly balanced as to their positive and negative character and the median deviation is never greater than one point.

From these distributions it appears that in the average case there is little difference in the P.C. of the Terman-Merrill and that of the Stanford Binet. To test this further, we have compared our present P.C. deviations with those obtained in the earlier study where we were comparing constancy and consistency of the IQ and P.C. where all tests were Stanford Binets.

In that study we divided our cases into two groups depending upon whether or not the child had passed his 16th birthday at the time of the last test. Consequently, we now divided our present cases in the same way in order to make

the comparison. Table 3 gives the two distributions for both age groups.

TABLE 3

Comparison of P.C. Deviations

Compared Tests	No.	Limits of Range	Limits of Middle 50%	Median
		C.A. 16 and Under		
SB vs SB	1762	+12 to −13	+2.8 to −2.4	+0.7
TM vs SB	264	+10 to −15	+3 to −2	+1
		C.A. Over 16		
SB vs SB	1132	+11 to −15	+2.4 to −2.3	+0.6
TM vs SB	86	+ 7 to − 7	+2 to −2	+0

Here we see the range of P.C. differences is no greater when the Terman-Merrill is compared with the Stanford Binet than when the Stanford Binet is compared with the preceding Stanford Binet. Also, the limits of the interquartile range and the medians fall at practically the same points. The distribution of our present deviations, which are derived from comparing the Stanford Binet with the Terman-Merrill, are very similar to those derived from comparing successive Stanford Binets. It is also worthy of note that the P.C. distributions for the two age groups are similar.

CONCLUSIONS

From these findings we conclude that, although the IQ as obtained in the New Binet does not give a consistent picture of mental growth in our group, the Heinis Personal Constant based on the mental age, as obtained by Form M, is consistent with the preceding P.C. based upon the 1916 revision. From this we further conclude that, for our average case, the mental age according to the Terman-Merrill is comparable with that of the Stanford Revision.

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A NOTE ON OVERCOMING STAGEFRIGHT AMONG MUSICIANS

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THE phenomena of stagefright occur among musicians very persistently, even among the leading professional artists who have had long years of experience. The problem of overcoming stagefright is one with which teachers and performers are frequently faced and the lack of success in many cases has led the writer to survey the psychological literature for possible origins and treatments which might be known. Since the results of this survey led to a number of successful informal experiments, the writer here presents the findings in brief form in the hope that others may find them equally useful.

It is not always possible for an audience to recognize that a performing artist is emotionally disturbed. Long years of training may have brought objective signs under control without having had any effect on the visceral patterns of hastened heart beat, inhibited stomach movement, heightened blood pressure, etc. The audience, too, may not observe slight slips of memory or other signs of disturbance of the thought processes, yet these deviations from normal behavior may put the performer in a state that is very near panic and may make it impossible for him to perform creditably. Not the least disturbing of the phenomena of stagefright are the before performance worries, some musicians being uncomfortable for weeks before performance and only with great effort being able to face the audience.

Within the limits of this study it would be impossible to state, as fact, that the origins of stagefright are known. On the basis of the psychological literature on the emotions and on

learning it is possible, however, to present a theory for these origins. Logically, stagefright is the result of at least one emotion-inspiring experience while in the audience situation. It is learned emotional behavior. This habit could also be learned accidentally by suggestion or imitation.

When controlled, the emotional stirring that accompanies public appearance is not entirely undesirable. Some performers find that this excitement is worked off during performance and makes performance more efficient. We are concerned here, however, only with those in whom stagefright impairs performance.

Standard methods for controlling audience fear consist of overlearning material, and practising performance before an audience. In her informal experiments the writer used these same methods but used them more systematically and under more controlled conditions. In planning the method of treatment the work of Guthrie[1] was found to be very helpful. His two books, "The Psychology of Learning," and "The Psychology of Human Conflict," form the principal background for this experiment. Following his suggestions the subjects were negatively adapted to stagefright by using below threshold stimulation in a series of situations where it was possible to so gradually increase stimulation that each experience resulted in a gain in confidence. In this retraining program it was assumed that the stimulus for stagefright was the audience situation. The undesirable response to the stimulus was fear, the desirable response, confidence. The purpose of the experiment was to call out confidence in the presence of the stimulus for fear, thus "stamping out" the fear response concomitantly with the "stamping in" of the confident response. After eliminating all hazards, excepting the audience situation, by preparing material to be used with great care and using material that was not too difficult, the subject was put into the audience

[1] The Psychology of Learning by Edwin Ray Guthrie. Harper Bros. New York, 1935. The Psychology of Human Conflict. Harper Bros. New York, 1938.

situation in the smallest possible doses. At first only a different instrument was used. Very gradually there were more changes in the environment, the subject still playing without an audience. The audience, too, was added to the playing situation in a very careful manner. At first there was an audience of only one person. Later there was performance in informal situations, gradually leading to more formal performances. Care was taken that added stimulation came only after confident reactions. The final step was the use of a formal performance situation that had once resulted in disturbing emotional upset.

Results of this program of negative adaptation are promising. If persisted in, this method may be expected to lessen or cure stagefright in at least some of the cases. Use of this method resulted in the adoption of an objective problem attitude which incidentally displaced fear as a distraction. Thinking became clearer, memory more certain, less overlearning was necessary, playing for others was no longer avoided, as it often is with those who are not confident, and as confidence increased there was much more success and pleasure in performance.

One subject, a professional musician with a background of 25 years of performing experience, found that this relatively simple method was effective in overcoming an audience fear of long standing. The other subject was a young pianist preparing her first important recital. She was able to perform without emotional disturbance. Both subjects found unexpected social and professional success as a result of the experiment. A program of negative adaptation such as is outlined above could be the starting point for a performing career among musicians or speakers who are now held back by stagefright alone.

PUBLICATION MEDIA AVAILABLE FOR APPLIED PSYCHOLOGY

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THIS paper reports a survey of media of publication in applied psychology made at the direction of the Committee on Professional Journals. It is the basis of a verbal report given at the Washington meeting, 1939, of the A.A.A.P. The methods used were (1) an analysis of the content of journals and (2) a study of citations in articles in the applied area. Both methods were limited to the journals available in the Indiana University Library.

ANALYSIS OF JOURNALS

In the spring of 1938 the author checked the latest bound volume (usually 1936 or 1937) of fifty-six journals available in the Indiana University Library. The subject fields of these journals were distributed as follows: psychology, 17; education, 18; sociology, 9; psychiatry, 4; business, 4; miscellaneous, 4. The total number of signed original articles and the number that might be considered applied psychology were tabulated. No absolute criterion of applied psychology was set up; rather a general principle that any psychological article in a non-psychological journal was to be considered applied, while articles in psychological journals having an applied bearing on the basis of a very liberal interpretation were so tabulated. Thus errors would be of inclusion rather than exclusion.

In the spring of 1939 the members of the author's class in the Use of Psychological Literature were set the task of making an analysis of the same journals and in the same manner as that made by the author a year earlier. These students were

each assigned two or three journals and the rather vague criteria described above were given them. In most cases the students analyzed volumes from 1937 or 1938. Detailed questions of what should be included as applied psychology were left to their own judgment. In spite of a very possible variation in criteria followed and the fact that a different volume was used, the rank order correlation between the percentage of applied papers for the 56 journals found in the two surveys was .57.

While not too much attention can be paid to the detailed percentages reported in either survey a convenient division may be made on the basis of the average percentages. On this basis the journals studied may be divided into five groups.

Group I. This group includes currently published journals, the contents of which are considered one hundred per cent in the field of psychological application. These journals are: *J. appl. Psychol., J. educ. Psychol., Amer. J. Orthopsychiat.,* and the *J. consult. Psychol.* In this group would also be included the *J. juv. Res.* and the *Psychol. Clin.,* both of which have recently ceased publication.

Group II. The second group includes those journals having fifty per cent or more of their articles allotted to applied psychology. These include *J. abnorm. (soc.) Psychol., Ment. Hyg., N. Y.,* and the *J. exp. Educ.*

Group III. In this group are those journals having from one-third to half of their articles applied. The titles here are: *J. educ. Res., J. soc. Psychol., Sch. & Soc.,* and the *Person. J.*

Group IV. This last group includes the journals having from one-quarter to one-third of their articles of significance to applied psychology. In this group are the *Amer. J. Psychiat., Psychiat. Quart., J. genet. Psychol., Elem. Sch. J.,* and *Occupations.*

This list of journals indicates at least in a rough fashion the relative significance of the various journals for applied psychology, at least insofar as direct analysis on the basis of rather indefinite criteria can do so.

ANALYSIS OF REFERENCES

In order to approach the problem from another angle, an analysis was made of references occurring in articles on applied psychology. Louttit and Lockridge[1] used this method to determine those journals which should be in even a small psychological library. It appears a reasonable argument that those journals most frequently referred to by writers in applied psychology would be of most significance as media of publication in this field. This study was also carried out with the assistance of the same students who made the preceding analysis. In most cases each student had the same journals for each task. The journals examined are divided into five subject groups.

Group I. Psychological. *J. consult. Psychol., J. appl. Psychol., J. genet. Psychol., J. soc. Psychol., Psychol. Rec., J. abnorm. (soc.) Psychol.*

Group II. Educational. *J. educ. Psychol., J. educ. Res., J. educ. Sociol., J. exp. Educ., Sch. Rev., Elem. Sch. J.*

Group III. Sociological. *Amer. J. Sociol., Amer. sociol. Rev., Family, J. juv. Res.*

Group IV. Psychiatric. *Amer. J. Orthopsychiat., Ment. Hyg., N. Y., Amer. J. Psychiat., Psychiat. Quart.*

Group V. Vocational. *Occupations, Person. J.*

In this analysis the student tabulated each journal reference that was made in articles considered as applied psychology. One volume (usually 1937 or 1938) of each journal was used. The tabulations were made by journal title and by decade period. The total number of references found was 1,449, distributed in decade periods as follows:

	1930–37	1920–29	1910–19	1900–09	1800's
Number	1,015	338	75	9	12
Percent	70	23	5	0.6	0.8

These data indicate that most of the references made in current

[1] Louttit, C. M., and Lockridge, L. L.: Psychological Journals. *Amer. J. Psychol.*, 1934. 46: 147–148.

applied literature are to papers published within the last eight years with over ninety per cent having been published since 1920. Thus the applied literature is more definitely recent than was shown for psychological literature in general by Louttit and Lockridge in 1933.

Another interesting finding is the relative frequency of references in journals of the several subject groups listed above. The pertinent data are shown in Table 1.

TABLE 1

Frequency of Reference in Journals in Various Subject Groups

	Total number of references	Per cent	Number of journals	Number of references per journal
Psychological	621	43	6	103.5
Educational	407	28	6	67.8
Sociological	92	6	4	23.0
Psychiatric	291	20	4	72.5
Vocational	38	3	2	19.0

A third question of interest is the extent to which writers publishing in journals of the various subject fields go outside of those fields in citing references. In Table 2 are shown the number of references in several subjects found cited in journals in the five subject groups. By these data it is shown that between fifty and sixty per cent of references are to journals in the same field. The remaining references are distributed unevenly and to different extents in the five subject fields.

Finally from the reference analysis we may select those journals which are most frequently cited. In the following list are included those journals cited to the extent of at least one per cent of all citations (10 times) for the 1930 decade:

J. educ. Psychol. (68), *J. soc. Psychol.* (50), *J. educ. Res.* (47), *Amer. J. Psychiat.* (46), *J. abnorm. (soc.) Psychol.* (35), *J. appl. Psychol.* (31), *Psychiat. Quart.* (31), *Amer. J. Orthopsychiat.* (30), *J. Juv. Res.* (29), *J. Amer. Med. Assoc.* (27),

TABLE 2

Areas to which Reference is Made from the Several Examined Fields

Examined groups	Psychology		Education		Sociology		Psychiatry		Vocational	
Referred to Groups	No.	%	No.	%	No.	%	No.	%	No.	%
Psychology	335	53.9	121	29.7	8	8.7	28	9.5	4	10.5
Education	70	11.3	228	56.0	4	4.3	5	1.7	7	18.5
Sociology	15	2.4	33	8.1	55	59.8	2	.7		
Psychiatry	59	9.5	14	3.4	19	20.6	164	56.4		
Psychoanalysis	8	1.3			1	1.1	14	4.8		
Medicine	78	12.5	3	.7	2	2.2	59	20.2		
Biology	22	3.5					14	4.8		
Science	8	1.3					2	.7	1	2.6
Business, vocational	14	2.2	4	1.0					26	68.5
Speech	2	.3	3	.7			1	.3		
Popular	3	.5	1	.2	3	3.3	1	.3		
Miscellaneous	7	1.1					1	.3		

This table is read thus: of all the references in journals included in psychology in the list presented earlier, 53.9% were to psychological journals; 11.3% to educational journals; 2.4% to sociology, etc.

Child Develpm. (21), *Amer. J. Psychol.* (21), *Psychol. Bull.* (20), *J. genet. Psychol.* 20), *Sch. & Soc.* (19), *Ment. Hyg. N. Y.*, (19), *Arch. Psychol., N. Y.* (18), *Psychol. Rev.* (18), *Elem. Sch. J.* (17), *Person. J.* (16), *Occupations* (15), *Brit. J. Psychol.* (12), *Archiv. Neurol. Psychiat., Chicago* (11), *J. ment. Sci.* (10), *J. exp. Educ.* (10).

SUMMARY

From the data used in compiling the two lists given above we may list in order the first twenty journals selected by four criteria:

1. Total number of times referred to.
2. Number of times referred to since 1930.

3. Number of times referred to in psychological journals only.

4. Combined ranking by survey of recent bound volumes (1936–1938).

In order to conserve space these four lists are not reproduced. (See appendix.) There were only nine titles included in all four as follows:

Journal of educational psychology
Journal of social psychology
Journal of abnormal and social psychology
Journal of applied psychology
Journal of educational research
American journal of orthopsychiatry
Journal of genetic psychology
Mental hygiene, N. Y.
School and Society

If to these nine we add the *Journal of consulting psychology* we have the ten journals of perhaps greatest significance as media of publication for material in applied psychology.

APPENDIX

Journals in the four lists

Total References

J. educ. Psychol.
Amer. J. Psychiat.
J. soc. Psychol.
J. juv. Res.
J. educ. Res.
J. abnorm. (soc.) Psychol.
J. genet. Psychol.
J. Amer. Med. Assoc.
Psychiat. Quart.
Sch. & Soc.
Amer. J. Psychol.
Amer. J. Orthopsychiat.
Psychol. Rev.
Ment. Hyg., N. Y.
Arch. Psychol., N. Y.
Psychol. Bull.
Child Developm.
Arch. Neurol. Psychiat., Chicago
Person. J.

Reference in psychology journals only

J. appl. Psychol.
J. soc. Psychol.
J. abnorm. (soc.) Psychol.
J. genet. Psychol.
J. educ. Psychol.
Amer. J. Psychol.
J. Amer. Med. Assoc.
Psychol. Rev.
Arch. Psychol., N. Y.
Child Develpm.
Brit. J. Psychol.
Psychol. Bull.

J. comp. Psychol.
J. exp. Educ.
Ment. Hyg., N. Y.
Amer. J. Orthopsychiat.
Psychol. Monog.
Genet. Psychol. Monog.
Sch. & Soc.
J. educ. Res.

References since 1930

J. educ. Psychol.
J. soc. Psychol.
J. educ. Res.
Amer. J. Psychiat.
J. abnorm. (soc.) Psychol.
J. appl. Psychol.
Psychiat. Quart.
Amer. J. Orthopsychiat.
J. juv. Res.
J. Amer. Med. Assoc.
Child Develpm.
Amer. J. Psychol.
Psychol. Bull.
J. genet. Psychol.
Sch. & Soc.
Ment. Hyg., N. Y.
Arch. Psychol., N. Y.
Psychol. Rev.
Elem. Sch. J.
Person. J.

*Combined Analysis**

J. appl. Psychol.
J. educ. Psychol.
Amer. J. Orthopsychiat.
J. consult. Psychol.
J. abnorm. (soc.) Psychol.
Ment. Hyg., N. Y.
J. exp. Educ.
J. educ. Res.
J. soc. Psychol.
Sch. & Soc.
Person. J.
Amer. J. Psychiat.
Psychiat. Quart.
J. genet. Psychol.
Elem. Sch. J.
Occupations

* Only 16 in this list because all others had less than 25% of their articles judged applied.

A METHOD OF ORGANIZING TEST MATERIALS OF THE KUHLMANN TESTS OF MENTAL DEVELOPMENT

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EASE of administration of the Kuhlmann Tests of Mental Development may not be obtained until the examiner has achieved a marked degree of familiarity with the wealth of materials used in the tests. Even at that point the large number of cards of varying sizes and the large number of expendable blanks, also of varying sizes, require additional time for organization either during or before the test administration. Moreover, the clinician, psychometrist or student, meeting the material for the first time, finds achieving familiarity a difficult and time consuming task. This paper presents a method of organizing the non-expendable, printed materials into a manual and the expendable materials into manila folder booklets. The materials, so organized, should aid in reducing the time required for administration of the tests as well as aid the new examiner in learning the procedures.

The non-expendable cards are mounted on light card-board sheets or manila folder sheets cut to an $8\frac{1}{2}'' \times 11''$ size. The cards are made secure by the use of strips of Dennison's gummed cloth mending tape, No. 5, white, $1\frac{1}{4}''$ wide. The tape may be torn into strips $\frac{1}{4}$ of the original width and cut to the desired length for most economical use. About 7 yards are required. Often it will be found necessary to trim off portions from the edges of the cards in order to effect appropriate spacing upon the page. With the manual open before the examiner, the test cards appear on the page to the left while the directions accompanying the test appear on the page to the right. Traditionally, examinations have been conducted with the subject seated directly across the table from the examiner. When the subject is seated at the end of the table to the examiner's left, more room is available for the examination materials, the examinee is less able to observe the recording of the scores and it is felt that greater informality is achieved. For these and other reasons the latter procedure is coming into preference, hence the manual has been set up in a form appropriate to this preferred method. Should the ex-

aminer be left-handed and prefer the subject seated to the right, the manual may be set up with the spatial arrangements directly reversed.

The manner in which the cards are mounted is illustrated in the eight accompanying figures. Each figure represents a double page of the manual viewed from the examiner's position. Some of the cards are so attached that they may be folded over. Others are attached on two or more edges so as to hold them firmly to the page. Under each figure appear the numbers of the tests which have cards mounted in the manner illustrated. Some of these numbers are starred to indicate some additional feature not illustrated in the figure. These additional features are discussed below.

Test 40. The small cards are built into a deck which may be folded back card by card. Over the top card, number 1 in the series, a cover is mounted. Note in the upper right portion of Figure 6 the illustration of how the deck is constructed. On the back of each card two strips of tape are attached. Alternate cards have the strips inset by the width of one strip. The strips should be attached to each card before the deck is put together. Start with the bottom card and work toward the top. When the deck has been completely put together, attach the bottom card to the large card by placing strips of tape along the top edge and half way down each side. Be sure that the deck is placed far enough in on the page so that the lower edge of the cover when folded back will still be on the large card as shown in Figure 6.

Test 42. A large detachable screen should accompany the cards for two purposes: first, to screen the cards from the subject's view while one card is being turned back, and second, to cover the card after it has been turned back so as not to confuse the subject when he is asked, "Which one did I take away?"

Test 49. When cutting the large card into halves, cut on a slight diagonal rather than squarely across so that a slight offset overlap will result as shown in Figure 7. This will make it easier to grasp when folding the upper half of the card back. Note that card 5 is detachable so that it may be shown to the subject in an inverted position.

Test 57. A detachable screen carried in a pocket such as is illustrated in Figure 8 may be used to cover the card just finished while the next card is being used.

Test 78. All seven cards may be mounted on a detachable strip of backing. By doing this the set may be held one way while showing the cards in an inverted position and in the opposite way while showing the cards during the trials. A detachable screen is also of use for covering each figure while the subject draws.

Test 89. The example card must be detachable so that the subject is free to manipulate it according to directions. A pocket such as is shown for the screen in Figure 8 may be constructed at the bottom of the page.

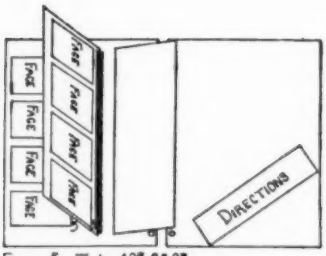

Figure 5. Tests 42*, 68, 98.

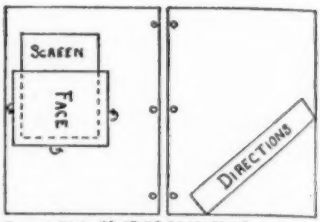

Figure 1. Tests 39, 45, 55, 64, 10a, 11a, 12a.

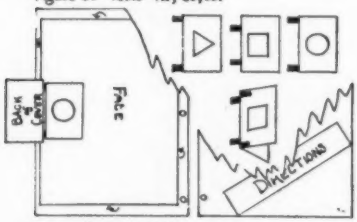

Figure 6. Test 40.*

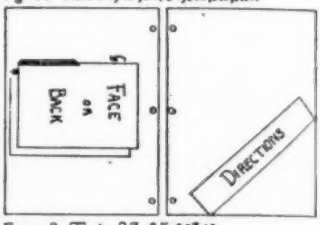

Figure 2. Tests 23, 85, 89*, 19a.

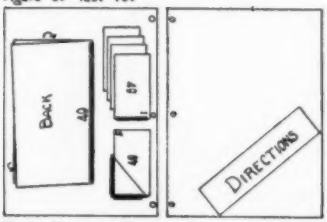

Figure 7. Test 49*

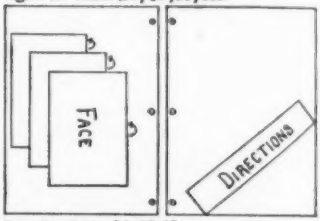

Figure 3. Tests 26, 33, 43.

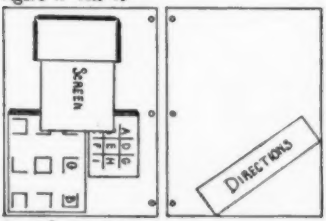

Figure 8. Test 78.

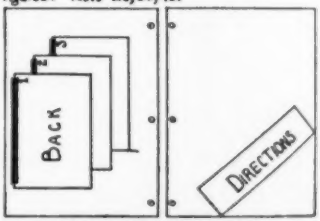

Figure 4. Tests 44, 57*, 76*, 81, 4a, 15a.

Arrows indicate edge secured by tape on under side. Hatching indicates visible strips of tape.

Test 6s. The third card is mounted on the page itself while the second and first cards are mounted on flaps. Each card should be mounted as illustrated in Figure 1. The cut pieces should be placed in the pocket formed by the unsecured edge.

Test 9s. Same as in Test 42.

Test 10s. Leave the edge of the card nearest the inside edge of the page unsecured to form the pocket. Secure the base and the two short sides.

Test 15s. A detachable screen is of use in covering each figure while the subject is drawing.

In mounting the cards it is desirable that the tape should always be on the back so that the face will be clear when exposed. This is possible in every test except Test 76. As shown in Figure 8, the tape should be placed on that side of the card used for practice. When cards are mounted in tiers, one should be careful that the amount of offset is not so great as to leave portions of the figures on the under cards exposed. And in tests where cards are mounted on flaps, the flaps should in each case extend to the outer edge of the page so as to act as screens for the cards mounted below. One should also be careful to leave sufficient clearance on the inside edge of the page for punching holes so that the pages may be placed in a loose-leaf note book. The key cards may be mounted on the right-hand page, face down, just above the directions. Precaution should be taken that the angle at which they are mounted does not allow the subject to see what is printed on them.

The expendable materials may be handled by placing them in individual manila folders cut to an $8\frac{1}{4}'' \times 10\frac{1}{4}''$ size and tabbed with a numbered index tab. Or, a booklet may be made of six folders placed one inside the other and stapled in the center. Three such booklets, appropriately cut to size and tabbed, will provide individual space for about ten of each of the expendable blanks without being too bulky.

NEWS AND NOTES

The Eleventh Institute for Education by Radio will be held at Ohio State University, Columbus, Ohio, Monday through Wednesday, April 29, 30 and May 1, 1940. In connection with the Institute there will be held the Fourth American Exhibition of Recordings of Educational Radio Programs. Further information may be obtained from W. W. Charters, Chairman, Institute for Education by Radio, Ohio State University.

The Advisory Committee on Education announces the publication of nineteen Staff Studies which makes available a body of material of great value and interest to students of education. The Report of the Committee presents a plan for Federal aid for general education in the States, embracing proposed annual appropriations to the States over a 6-year period for general elementary and secondary education, preparation of teachers, school buildings, administration of State education departments, rural library service, educational services for adults, and cooperative educational research. The Staff Studies may be obtained separately or as a complete set from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. The cost of the complete set is $4.80.

The Midwestern Psychological Association will hold its annual meetings on May 3 and 4 with the department of psychology at the University of Chicago. Professor F. C. Kingsbury is acting as local chairman of the meetings. The presidential address will be given by Professor J. P. Guilford of the University of Nebraska. In addition a full program of research papers and symposia is being scheduled by the program committee under Professor Fred McKinney of the University of Missouri. Psychologists and others in related fields are cordially invited to attend the meetings.

The Thirty-fourth Annual Report of the President and Treasurer of The Carnegie Foundation for the Advancement of Teaching for the year ending June 30, 1939, has recently been received. Under the section, "Colleges and the Public's Money," President Walter A. Jessup asserts that many institutions are offering courses which they cannot afford, that problems might be simplified if more colleges would center their attention wholly on undergraduate teaching and offer only such courses as can be paid for. "Scientific inquiries that have been made in recent years suggest that excellence of the college product is not so much a function of

college equipment or of diversified curriculum as of other things—things that are much more simple and less expensive: careful selection of staff, careful selection of student body, a budget that is balanced from the standpoint not only of the comptroller but of the student. If the student is to pay for an ever-larger share of the cost of education, he has a right to expect the best job possible for the time and money he expends."

With the cooperation of the Altoona High School, the Cheltenham Township High School at Elkins Park, and the Radnor Township High School at Wayne, all in the State of Pennsylvania, the Foundation has conducted under the direction of Mr. W. S. Learned, an experiment in responsible learning which had for its purpose "to replace the course 'unit,' the 'credit,' and the teachers' 'mark' as dominating the pupil's mind, with a healthy and controlling interest in the meaning of ideas and in a pupil's ability to use them intelligently." The results of the experiment indicate that high school pupils learn more and better on their own responsibility than others still bound by these "outworn conventions of our secondary and higher education."

The American Council of Guidance and Personnel Associations held its seventh annual convention in St. Louis, Missouri, from February 20–24, 1940, together with the National Association of Deans of Women, National Vocational Guidance Association and the American College Personnel Association and their Affiliated Societies. Of most interest to the readers of this Journal may be the mention of some of the subjects discussed in the general sessions of the American College Personnel Association. Among these are included "Aspects of Student Motivation," "Case History Notes," "Group Psychiatric Conferences," "Some Pressing College Personnel Needs," "Research Relating to Group Activities." Of much interest to many were the Discussion Groups in which such topics as the following were presented: "Placement," "Selection and Admission of Students," "Diagnosis and Counseling," and "Student Activities and Orientation." Each group had been assigned a chairman and a recorder. The panel members taking part in this division included L. L. Jarvie, Rochester Athenium and Mechanics Institute; J. E. Bathurst, Birmingham-Southern College; John G. Darley, University of Minnesota; and E. S. Jones, University of Buffalo.

At the first General Session of the American Council of Guidance and Personnel Associations, Eduard C. Lindeman, New York School of Social Work, spoke on "Education in Search of a Goal." At the afternoon General Session, "The Rôle of Education in Emotional Adjustment" was discussed by Daniel A. Prescott, of the American Council on Education. Among the subjects of the Discussion Groups were the following: "The Development of Social Behavior," "The Democratic School in Action,"

"Uses of the Curriculum in the Adjustment of College Students," "Emotional Maladjustments Among College Students and Adults," "Personality Adjustments of Rural Youth in Country and City," "The Problem of Adjustment in a Modern City," "An Approach to Problems on Personal Adjustment."

An announcement has been made of the 1940 examinations of the National Committee on Teacher Examinations to be administered on March 29–30, 1940. Up to the present time no comprehensive set of "teacher examinations" has been provided. Recently, at the request of many school teachers and administrators, the American Council on Education has undertaken to prepare a battery of objective tests for the examination of teaching candidates. The examinations, of the objective type, will cover such areas as the understanding and use of the English language; reasoning ability; knowledge of contemporary affairs; general cultural information; understanding of professional educational points of view, goals, attitudes, and methods; and mastery of subject-matter to be taught. A permanent file of results will be kept by the Committee to be used in aiding candidates in finding positions. Inquiries concerning these examinations should be addressed to the National Committee on Teacher Examinations, 15 Amsterdam Avenue, New York, N. Y.

The Civil Service Assembly of the United States and Canada announces the early appearance of a quarterly journal, *Public Personnel Review*, which will deal with the administrative and technical aspects of public personnel administration. A major department of each issue will be devoted to abstracts or digests of articles appearing in other publications and dealing with problems in personnel administration and closely related fields. The Civil Service Assembly, organized in 1906, is an association of public agencies, officials, and private citizens engaged or interested in public personnel administration. The constituent public agencies of the Assembly are civil service commissions, boards, or personnel offices serving an entire governmental jurisdiction, such as the national, state, or local governments of the United States. The Assembly is a non-profit organization. Funds for its support are obtained from membership fees, special gifts or grants, and the sale of published material. Further information may be obtained from the Assembly Headquarters, 1313 East 60th Street, Chicago, Illinois.

Varied were the discussions at the White House Conference on Children in a Democracy, held in Washington, D. C., January 18–20, 1940. "Child Labor and Youth Employment" was characterized as "still one of the most serious problems in this country" despite the fact that there are

fewer child workers now than there were ten years ago. Children continue to be exploited not only in commercialized agriculture, street trades, and industrial home work, but also more than is generally known in little-regulated industries. Public attention is concerned not only with the prevention of employment of immature youth too early, but also with the problems of the vocational preparation and guidance of youth and of providing suitable work opportunities for those who have left school and are ready for employment. It is estimated that the youth group constitutes one-third or more of the total unemployed and numbers three to four millions.

According to a report on "Economic Aid to Families," economic security is basic to the well-being of America's children. The greatest need is work for the eight or nine million unemployed adults and the prospect that there will be work for the children themselves as they reach a working age.

Another report on "Children in Minority Groups" made a strong plea for racial tolerance. It was argued that all minority groups have contributed and will continue to contribute to this country's culture, that all such groups have a right to be here, and yet "millions of children in the United States suffer disadvantages and handicaps arising out of the fact that they were born into groups widely regarded and treated as inferior to the major part of the population because of their racial or national origin."

The Second Middle Atlantic Educational Congress will meet March 3, 4 and 5 at the William Penn Hotel in Pittsburgh. The main speaker of the program will be Dr. William S. Gray of the School of Education, University of Chicago. His opening topic will be "The Reading Problem in the School System."

Dr. A. M. Skeffington, Director of the Graduate Clinic Foundation and Educational Director of the Optometric Extension Program will hold his annual clinic in conjunction with the Congress. Dr. William Sherard, former instructor in the School of Optometry at Ohio State University, will have the subject of "Adapting the Eye to the Reading Act with Orthoptics." Later he will lecture on "Orthoptics' Place in Correcting Reading Disabilities." Dr. Blaess of Detroit will illustrate his lecture on "Pathological Abnormalities of the Human Eye" with hand-painted slides and moving pictures in color of difficult operations. The Congress will close with a panel discussion on reading problems and other topics of interest to Educators and Optometrists.

BOOK REVIEWS

PERCIVAL M. SYMONDS. *The Psychology of Parent-child Relationships.* New York, D. Appleton-Century Co. 1939. Pp. xiv + 228.

The literature of mental hygiene for the past twenty years has contained much on the problem of parent-child relationships. As with so many other aspects of the dynamics of behavior the earliest interest in this particular problem is found among the psychoanalysts. During the early 1930's Dr. D. M. Levy formulated an hypothesis concerning maternal overprotection and rejection which was then investigated by students at the Smith College School for Social Work. In the present book Dr. Symonds has summarized these investigations as a preface to the reports of his own research.

The author proposes that parental attitudes can be represented on a plane whose coordinates are acceptance-rejection and dominance-submission. In two separate investigations the author studied the behavior of children living in families where the parental attitudes lay at the extremes of these axes. Data were secured by means of questionnaire and check list from former students who were engaged in guidance work. There were received histories of 31 rejected children and 31 matched children who were accepted. Data were also secured for 28 pairs of subjects; one of each pair lived in a parent dominated home and the other in a child dominated home.

The results are too extensive for statement here but may be summarized in terms of the accepted and dominated children. The accepted children were socialized, friendly, stable, dependable, in short had desirable characteristics of personality and behavior. The dominated children were better socialized, but were shy and sensitive. Children in the rejected and submissive groups showed characteristics the opposite of these.

The last three chapters of the book are devoted to a discussion of varieties and etiology of parent-child relations, of teacher-child relations, and of counselor-client relations. The first of these is an excellent summary of the kinds of relations observed and the sources in the parents' own life for their attitudes. In his discussion of teacher-child relations the author points out that the teacher for some hours of the day plays the part of parent and is therefore treated as the child treats his own parents. The last chapter on counselor-client relations, nearly half of which is quotation or paraphrase from the writings of a number of psychoanalysts, seems to have only the most formal relation to the rest of the book.

This book is a very satisfactory summary of the literature on parent-child relations, and the original investigations reported are an acceptable

addition to a limited experimental literature. It is a "must" on the reading list of every psychologist working with children.

C. M. LOUTTIT,
Indiana University

TEAGARDEN, FLORENCE M. *Child Psychology for Professional Workers.* Prentice-Hall, pp. 641, $3.25.

The book is developed from lectures on Child Psychology, "modified somewhat from the usual course and adapted to the needs of case workers in social agencies." The author is consistent with this point of view. Scattered through preliminary chapters are paragraphs relating the materials to social work.

Chapter I sketches "some of the essential mechanisms of heredity," including the maturation of the sex cell, and fertilization. It is one of the few clear discussions of cell development. A sentence on page 16 probably expresses the point of view: "Now, however, with expansion of the Mendelian principles through knowledge gained from subsequent research, it is thought that all inheritance is Mendelian." The origin of behavior is dismissed with (p. 18), "One might say, in other words, that we inherit structure rather than function or behavior."

The second chapter applies the principles of heredity to the case load. The question as to whether drugs and diseases affect the germ plasm and "thereby affect succeeding generations" is discussed, and then the attention is turned to the inheritance of such traits as temperament, linguistic ability, special aptitudes, lefthandedness, blindness, and numerical ability.

Getting the Child into the World, (Chapter III) resumes a detailed discussion of mitosis, (through germinal disk, embryo, and fetus) fertilization in the fallopian tube or oviduct, amniotic sac, placenta, etc. Such topics as prenatal anomalies, accident at birth, ante- and postpartum care, attitude toward pregnancy, birth processes, birth injury, birth trauma, identification of babies, birth rates, naming the child, and the unmarried mother illustrate the variety and wealth of information offered.

In delineating the development of the child's motor equipment, the author used but little else than the results of Shirley's study. We might ask why did she not at least use some pictures of the development of locomotion from a study quite as widely known, and no less authentic.

From chapter VII clinical material predominates. Topics on "good" and "poor" homes, ambivalence, rejection, punishment, broken homes, foster homes, children in institutions, and adoption indicate the direction of the discussion. Concerning the child's emotions, considerable space is devoted to the autonomic nervous system and less than a page to conditioning. The section dealing with fears is splendid, but jealousy, the nervous child, anger, and suicide in children are treated in skimpy paragraphs. This is typical of the author's treatment. It seems that she wanted at

least to mention many topics, even though the space prohibited discussion. Shall we remark that every idea related to child psychology cannot be even mentioned in one book. Would not the author achieve as much prestige by an adequate discussion of fewer topics as by a display of erudition?

Although the author feels that social workers should not be required to have the skill of administering intelligence tests, yet considerable space is given to tests, I.Q., A.Q., M.A., aptitude and performance tests. A very useful table relates possible academic achievement with levels of I.Q.

The chapter, The Child and His School, is one of the best. Many studies are cited showing the effect of the teacher's personality upon the pupils, and the teacher's lack of a uniform conception of a 'behavior problem' in children. "The picture given of the teacher's lack of skill and finesse in interpreting and redirecting conduct is disheartening." Too true!

Delinquency and its causes are discussed at length. After pointing out the results of many studies, including Healy and Bronner's, and the Glueck's, the impression is left that the factors are so many and complex, reclamation is difficult, infrequent, and unpredictable.

The last three chapters present the topics of psychological and social problems incident to certain diseases in children, visual and auditory handicaps, and speech defects and crippled children.

The author writes in an interesting style. The selection of material from almost unlimited sources gives evidence of wide reading and splendid organization. The viewpoint, from pro and con evidence, is sane and scientific.

The book contains a wealth of material, including 1171 references, in 641 pages of clear type.

Personally, we should have liked to see the chapter on The Child and His Home placed next to the chapters on The Child and His School and Behavior Difficulties.

The book fulfills its purpose.

J. R. GENTRY,
Ohio University

W. ALBIG. *Public Opinion.* New York: McGraw-Hill, 1939. Pp. xiii + 486.

This is an all inclusive text on public opinion and its many ramifications. The author begins by defining public opinion as ". . . any expression on a controversial topic . . . (which) . . . results from the interaction of persons upon one another in any type of group. . . ." (p. 3). He goes on to discuss how public opinion develops, the operation of psychological processes in opinion, the leader and personal symbolism, etc. After a two-chapter discourse on the measurement of opinion, there are two chapters on censorship, and two on propaganda. A chapter is devoted to the effect

which the radio, motion pictures, the newspaper, and the graphic arts have upon public opinion.

Psychologists will do well to read this book. It contains an excellent historical summary of most of the issues discussed. Moreover, the emphasis is almost as much psychological as sociological, even though the author is a member of the Sociology Department of the University of Illinois. Psychologists may, however, take exception to several of his statements applying to psychology, such as the one on page 23, "That the masses, under democracy, have cultivated values of a low order has been declared with increasing frequency of late years, not only by dictators but also by philosophers and psychologists."

Psychologists interested in the measurement of public opinion will be disappointed to discover that Albig's discussion of this point is very largely theoretical and somewhat elementary. Laboratory studies rather than the common public-opinion polls are the basis of most of the discussion. Probably if the author had depended more upon the poll developments, he would not have made statements such as "the possibilities of the use of successive straw polls on the same subject to indicate changing opinion have not been explored" (p. 231). The fact is that all of the major poll agencies repeat many questions just to measure such a possible shift.

Although the author has not stated for whom the book is intended, it is obviously written for the college student. An historical approach to every problem is used, and very few dogmatic statements are made. Actually, Albig is so careful to state both sides of particular points that the reader may not, in some cases, be able to discern which point of view he leans toward. On the whole, though, the book is well written. The author's interesting style and well-phrased and precise statements are supplemented with frequent humorous allusions. For example, in his discussion of language and public opinion, Albig states "'In God We Trust' is printed on American money. During the depression a waggish banker suggested that there should be stamped on the other side 'I hope that my Redeemer liveth.'" (p. 82).

A few small errors detract somewhat from the book. Sometimes the date of a journal reference is given, while other times it is not. In a book of this sort one does not expect the use of the word "Kodak" as a generic term (p. 83). Nor is the reader likely to have confidence in other statements when one such as this is made. "Every sizable newspaper, except the *New York Times* and the *Christian Science Monitor*, runs at least a page of (comics) daily." (p. 424). Off hand, the reviewer can think of at least one additional large paper, the *New York Herald Tribune* which certainly does not run a daily page of comics.

The book, however, is astonishingly inclusive, and should be of real value for those in academic life who are interested in public opinion. But

few persons in the business field will find enough practical material in the book to warrant reading it.

ALBERT B. BLANKENSHIP,
Hartwell, Jobson & Kibbee, New York City

WAIT, W. T., *The Science of Human Behavior.* New York: The Ronald Press Company, 1938. Pp. xv + 335.

In "The Science of Human Behavior," Professor Wait addresses himself to university freshmen in an attempt to explain the "hows" and "whys" of human behavior. The book thus becomes an attempt to answer the question "How do we get that way?"

To say that Professor Wait completely succeeds in his task would be to invest him with more knowledge than that of all psychologists combined. The question is one to which no categorical answer can so far be given. The present state of our knowledge regarding the ways of human behavior is incomplete. We can pass on what we know, but at the same time we must point out that our knowledge is only tentative, and that further important developments are to be expected.

The reader who bears these cautions in mind will derive much value from the book. But whoever expects a final answer to the question "How do we get that way?" will be disappointed, for neither Professor Wait nor any one else can tell us that—yet.

While Professor Wait has succeeded in giving the reader a working knowledge of the so-called science of human behavior, he has failed, in this writer's opinion, to write a textbook in the psychology of human behavior for freshmen. The material is treated in too cursory a manner. There is no chance for the student to form a basis of the knowledge about human nature on which he can stand and build further. Professor Wait admits that he has "departed from the traditional outline of texts in general psychology," (V) and has tried to give the student a glimpse over the whole field of the subject.

However, there is no short-cut to psychology. The beginner must have an introduction to physiological psychology before he can proceed very far. But Professor Wait attempts to cover everything from normal to abnormal psychology, and consequently, does not leave a clear impression in the mind of the reader.

Beginning his treatment of the science of human behavior with the question "What is psychology?" Professor Wait introduces his subject in the first chapter. The second chapter gives a brief review of the attempts made by man from earliest times to explain human behavior. The problem, according to Professor Wait, appeared when man discovered himself as a dual personality, as both spiritual and material. The first explanation of this duality took the form of animism, when it was believed that every animate and inanimate object possessed within itself a spirit which acted as a motivating force. Among the more enlightened people

animism gave way to the conceptions of the Idea and Form, sponsored respectively by Plato and Aristotle, as the motives of our behavior. During the Middle Ages the supreme ecclesiastical authorities assumed the role of motivating behavior. Finally, in our own time, motives are divided into three classes—physiological, social, and psychological.

Professor Wait next concerns himself with biological and social inheritance as related to behavior traits. Biological inheritance leads to a consideration of instincts, emotions, organic motives, and intelligence. Professor Wait's treatment of instincts and intelligence is inadequate. The instincts in human beings have definitely been shelved by the great majority of psychologists and are no longer of significance in a consideration of human behavior. Professor Wait still holds that there are a number of human instincts (pp. 70–84) and that they play an important part in directing our behavior. In the treatment of intelligence insufficient weight is given to the latest findings under this heading.

Having done with biological inheritance, Professor Wait tackles the question of social inheritance. He recognizes the far-reaching influence that social surroundings have upon the behavior of the individual. Whatever the individual does, he does as a member of a social group, and this membership and what it entails, mold his personality. To make a little more vivid the influence of the social group upon the individual, Professor Wait introduces to good effect instances of behavior motivated by imitation and suggestion. A cursory discussion of intrinsic behavior is also given. Consciousness and the various types of thinking serve to illustrate this behavior. Following this, one chapter is devoted to individual differences of behavior.

So that the student may gain a better understanding of normal behavior, Professor Wait introduces a short discussion of abnormal behavior of the psychoses, the psycho-neuroses, and the neuroses. He holds with the modern tendency in treating normality and abnormality not as definite types, but as relative terms which only have a methodological value. To a certain extent we are all abnormal. Normality is merely an arbitrary standard chosen by the society in which we live. Any behavior that deviates from this standard is abnormal.

The discussion of abnormal behavior gives Professor Wait an opportunity to say something of the wonderful work that is being done in the sphere of mental hygiene. Starting with the experiences of Clifford W. Beers (who, in the early part of this century was confined to an institution for the insane, but came out of it and completely recovered) the mental hygiene movement has made such remarkable progress that it now has international ramifications. Mental hygiene has come to satisfy the crying need for the re-integration of personality in those cases where the demands of our civilization have caused disintegration.

Professor Wait's book reads well. The reader who delights in the particular as opposed to the general, will find in the book a host of very

good and pertinent illustrations. The work is well suited for a supplementary book in general psychology, but it is the writer's opinion that, as a general textbook in this subject, it falls short of the standard set by Gardner Murphy.

PETER HAMPTON,
University of Manitoba

STEINACH, EUGEN. *Sex and Life.* Viking. 1940. 252 pages.

A prediction may be ventured that the contents of this book will promptly find their way into college courses in abnormal psychology, mental hygiene, physiology, neurology, biology, physiological chemistry and marriage. That is not to say the whole material is suitable to any one of these but there is something pertaining to each which may be selected.

It is fascinating to follow the thinking of Dr. Steinach through the logical and chronological progression of experiments that prove one point after another about the functions of sex glands. In the usual textbook presentations of this subject there is much that is omitted and it is for this reason that this book is valuable in broadening our knowledge. Carefully and clearly are explained the wide-spread effects of sex hormones on puberty, senility, cells, circulation and bisexuality, as well as many other interesting findings.

It is essentially the story of the scientific life of a biologist. In many places the work of others on the same subject is given notice, but always these accounts are contributing to the advance in information only because of the basic Steinach findings.

Although the majority of the studies cited are with rats and guinea pigs, the author does include some case histories of "reactivation" on men and women. There is more than a suggestion here that human beings may be enabled to grow old more gracefully.

In working with the lower animals, the author designed objective tasks for them to perform. Thus, he has two lines of evidence for the effects of sex gland variation. The anatomical evidence is presented by photographs and the behavioral is given by comparative scores on tests.

Here, in the chapter on experimental hermaphrodites, one sees the reason why sexuality is distributed in a fashion that approximates normal probability.

In general the results of experiments described in Sex and Life are allowed to speak for themselves. There is little written here that could be called speculative.

The photographic illustrations are convincing and there is an up-to-date bibliography.

Surely this book can be highly recommended to psychologists.

K. W. OBERLIN,
University of Delaware

NEW BOOKS AND PAMPHLETS RECEIVED

Books and pamphlets for review should be sent to JAMES P. PORTER, *Editor*, JOURNAL OF APPLIED PSYCHOLOGY, Ohio University, Athens, Ohio.

Australian Council for Educational Research Ninth Annual Report, 1938–1939. Brown, Prior and Anderson, 430 Little Bourke Street, Melbourne, Australia. 64 pp.

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Current Psychologies. A Critical Synthesis. ALBERT J. LEVINE. Sci-Art Publishers, Cambridge, Mass., 1940. $2.75. 270 pp.

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Personal Aggressiveness and War. E. F. M. DURBIN AND JOHN BOWLBY. Columbia University Press, New York, 1939. $1.50. 154 pp.

The Prospects of Philosophy. JOHN J. ROLBIECKI. Benziger Brothers, Inc., New York, 1939. $2.50. 161 pp.

The Psychology of Conversation. T. H. PEAR. Thomas Nelson & Sons, New York and London, 1939. 2/6. 171 pp.

Report of Sixteenth Annual Meeting of The American College Personnel Association. KARL M. COWDERY, *Editor.* Cleveland, Ohio, February 21–25, 1939. 203 pp.

We Call It Human Nature. PAUL GRABBE. Harper & Bros., New York, 1939. $1.75. 120 pp.

Workers on Relief. GRACE ADAMS. Yale University Press, New Haven, Conn., 1939. $3.00. 344 pp.